Final Ballot for the

Origins Awards 1987

Presented by the Academy of Adventure Gaming Arts and Design

1. Best Historical Figure Series, 1987
__American Civil War, 15mm, Stone Mountain Miniatures
__American Plains Line, Rafm
__Shogun Hard Guys: The New Samurai, Ral Partha Enterprises

2. Best Fantasy or Science Fiction Figure Series, 1987
__BattleTech Mech Warriors, Ral Partha Enterprises
__Dungeons and Dragons, Citadel Miniatures
__Groo the Wanderer, Dark Horse Miniatures
__Julie Guthrie's Fantasy Line, Grenadier Models
__Renegade Legion Interceptor Line, FASA Corp

3. Best Vehicular or Accessory Series, 1987
__BattleTech Mech, Ral Partha Enterprises
__Civil War Artillery, RAFM
__Hovels and Buildings, 15 & 25mm, Stone Mountain Miniatures
__Machineries of Destruction, Citadel Miniatures
__Star Trek Miniatures, FASA Corp

4. Best Miniatures Rules, 1987
__Chaos Wars, Rules according to Ral for Fantasy Battles, Ral Partha Enterprises
__Harpoon, Game Designers' Workshop
__Warhammer 40,000, Games Workshop

5. Best Role-Playing Rules, 1987
__Mega Traveller, Game Designer's Workshop
__Paranoia 2nd Edition, West End Games, Inc
__Star Wars, West End Games, Inc
__Teenagers From Outer Space, R. Talsorian Games
__Top Secret S.I., TSR, Inc

6. Best Role-Playing Adventure, 1987
__Blood of the Yakuza, AD&D, TSR, Inc
__Future in Flames Series, Marvel Super Heroes, TSR, Inc
__Ochimo, the Spirit Warrior, TSR, Inc
__Scared Stiffs, Ghostbusters, West End Games, Inc
__Tournament of Dreams, Pendragon, Chaosium, Inc
__Who Watches the Watchmen? Mayfair Games, Inc

7. Best Role-Playing Supplement, 1987
__GURPS Horror, GURPS, Steve Jackson Games
__Manual of the Planes, AD&D, TSR, Inc
__Miskatonic University Kit, Call of Cthulhu, Chaosium Inc
__Star Wars Sourcebook, Star Wars, West End Games, Inc
__The Forgotten Realms, AD&D, TSR, Inc

8. Best Graphic Presentation of a Role-Playing Game, Adventure or Supplement, 1987
__The Gazetteer Series, AD&D, TSR, Inc
__Miskatonic University Kit, Call of Cthulhu, Chaosium Inc
__The Forgotten Realms, AD&D, TSR, Inc
__Star Wars, West End Games, Inc
__Star Wars Sourcebook, Star Wars, West End Games, Inc

9. Best Pre-20th Century Boardgame, 1987
__Blood Royale, Games Workshop
__Brittania, The Avalon Hill Game Company
__D' Espanol-Talavera, Clash of Arms Games
__La Granda Armee, SPI/TSR, Inc
__Shogun, Milton Bradley Company

10. Best Boardgame Covering the Period 1900-1946 for 1987
__Battle for Moscow, Game Designer's Workshop
__Moscow 1941, SPI/TSR, Inc
__Onslaught, SPI/TSR, Inc
__Scorched Earth, Game Designer's Workshop
__Patton's Best, The Avalon Hill Game Company

11. Best Boardgame Covering the Period 1947-modern day for 1987
__Air Superiority, Game Designer's Workshop
__Central America, Victory Games, Inc
__Fire Team, West End Games
__Seventh Fleet, Victory Games, Inc
__Team Yankee, Game Designers' Workshop

12. Best Fantasy or Science Fiction Boardgame, 1987
__Arkham Horror, Chaosium, Inc
__Gammarauders, TSR, Inc
__Isaac Asimov Presents Star Traders, Steve Jackson Games
__Renegade Legion, Interceptor, FASA Corp
__Star Warriors, West End Games, Inc

13. Best Graphic Presentation of a Boardgame, 1987
__Chase, TSR, Inc
__Gammarauders, TSR, Inc
__Onslaught, SPI/TSR, Inc
__Shogun, Milton Bradley Company
__Star Warriors, West End Games, Inc

14. Best Play-By-Mail Game, 1987
__Alamaze, Pegasus Productions
__Heroic Fantasy, Flying Buffalo, Inc
__Nuclear Destruction, Flying Buffalo, Inc
__World Wide Battle Plan, Flying Buffalo, Inc

15. Best Fantasy or Science Fiction Computer Game, 1987
__Eternal Dagger, Strategic Simulations, Inc
__Phantasie III, Strategic Simulations, Inc
__Pirates, MicroProse, Inc
__Realms of Darkness, Strategic Simulations, Inc

16. Best Military or Strategy Computer Game, 1987
__Airborne Ranger, MicroProse, Inc
__Panzer Strike!, Strategic Simulations, Inc
__Project: Stealth Fighter, MicroProse, Inc
__Shiloh: Grant's Trial in the West, Strategic Simulations, Inc
__Sons of Liberty, Strategic Simulations, Inc

17. Best Screen Graphics in a Home Computer Game, 1987
__Airborne Ranger, MicroProse, Inc
__Pirates, MicroProse, Inc
__Project: Stealth Fighter, MicroProse, Inc

18. Best Professional Adventure Gaming Magazine, 1987
__Autoduel Quarterly, Steve Jackson Games
__Computer Gaming World, Russell Sipe
__Dungeon, TSR, Inc
__Fire & Movement, DTI, Inc
__Gateways, Gateways Publications, Inc
__Strategy & Tactics, World Wide Wargames
__White Dwarf, Games Workshop

19. Best Amateur Adventure Gaming Magazine, 1987
__Alarums & Excursions, Lee Gold
__Polyhedron, TSR, Inc
__Volunteers
__Wild Hunt

No. 33

CHALLENGE

GDW's Magazine of Adventure Gaming

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From the Management

My first experience with role-playing games was, as I'm sure it was with many of you, with a certain popular fantasy game. A friend of mine described to me how the game might develop—"You can go down into a deep cavern, fight with a dragon and take his treasure. Then on the way out half the treasure might magically turn into some other monster you have to defeat!" As a young man eager to experience the thrill of victory in a fantasy universe, I immediately agreed to give it a try. So he came over with some other friends and with his boxes filled with what I have come to find are the necessities of role-playing games; rules books, dice, and *miniatures*.

From my first days with role-playing games, miniatures have been an integral part of every game. They are the little pieces of three dimensional reality which really make the situations come alive. It is one thing to have the referee tell you that

Issue 32 feedback was as follows:

JUST DETECTED

CONVENTIONS

WIZARD'S CHALLENGE

April 29-May 1, Regina, Saskatchewan. This sixth annual convention will be held at the Westwater Inn in Regina, Saskatchewan. The premier event will be a four-player team **AD&D** tournament. Other events will include a **Supremacy** tournament, **Battletech,** and **Car Wars**. An opening-night costume ball, open gaming, movies, a games auction, and a closing night medieval feast and awards presentation are some of the planned weekend activities. Contact The Wizard's Corner, 2124B Broad St., Regina, Saskatchewan, CANADA, or call (306) 757-8544.

MINIATURES

15MM SCIENCE FICTION

The Reiter (a mail-order hobby shop dealing in books, games, magazines, and miniatures) has acquired a limited supply of out-of-production 15mm science-fiction miniatures. For a list, write The Reiter, 3440 S. Monterey, New Berlin, WI 53151.

1/72 SOVIETS

TCI/ACE announce releases in the 1/72-scale Soviet Armor Series. The miniatures series includes models of the T-55, T-72, BMP-1U, BRDM-2, ZSU-23-4M, and MTLB APC, among others. Write TCI/ACE, 4732 E. Pearl, Boulder, CO 80301.

1:87 SCALE T-72 MBT

Petner Panzers announces the first in a series of 1:87th scale modern Soviet vehicles and equipment: a T-72 Main Battle Tank. Petner Panzers, PO Box 1221, Bensalem, PA 19020-0844.

1:87 SCALE T-62A MBT

Armourtec Scale Models has announced the release of the first of a line of 1:87th scale modern Soviet equipment: the T-62A Main Battle Tank. A BMP-1 will be followed by a BTR-60PB and a T-54/55 MBT. Contact Amourtec Scale Models, PO Box 51550, Pacific Grove, CA 93950-6550.

Haute Cuisine a la 2000

Editor's Note: As part of our continuing efforts to bring a greater feeling of realism to **Twilight: 2000**, we hereby bring you a rundown of the Meal, Ready to Eat, Individual (MRE), about which some of our readers have expressed a curiosity. First, some background material by Fred Kiesche, followed by a short review from *Challenge*'s resident gourmand and restaurant critic (who doesn't get many assignments, so he has to be grateful for what work he does get).

PART I: THE MRE—BACKGROUND

MRE is the military abbreviation for "Meal, Ready-to-Eat, Individual," and is the army's latest attempt to find a quick, readily portable and reasonably nutritious way to feed personnel in the field without access to the normal mess units. Recognizing that good food is important to morale, the army strives to provide troops in the field with two hot meals a day, but in practice this is not always possible (in my last field training exercise, we ate nothing but MREs for several days). The MRE replaces the older "Meal, Combat, Individual," (commonly called the C ration). The main difference between the two is that the MRE contains no cans and has fewer freeze-dried items (which require extra water and are harder to prepare since the user must add water to reconstitute the meal) and more retort-sealed heavy foil "wet pack" pouches (which simply need to be heated in some way). Both meals could be consumed cold. In 1987, several changes were implemented: 12 new menus were created, a fruit drink mix and a dessert were added to all menus,

the size of the entree was increased from five ounces to eight ounces, a longer spoon was included (to allow users to dig all the food from a packet without soiling their knuckles), and a cardboard support base was added (to hold hot packets and prevent burned fingers).

In the near future, the Army will issue official items to help heat MREs. A canteen-cup stove is being designed that will fit around the regular canteen and cup (inside the existing canteen cover) when not in use. In use, the cup will fit on top of the stove and will use standard fuel tablets. This will replace the privately purchased stoves and field expedients (such as placing the packets on a hot engine block for 10 minutes) that have been used up until this time.

MREs can be purchased by civilians (try the local military surplus or outdoor supply store) and are used by hikers and campers. Some people use them for auto, aircraft, or boat emergency kits (they last for years provided they are stored in a relatively cool, dry environment).

MENUS

The 12 older menus are as follows:

Menu 1: Pork patties, pineapple or apple slices, cheese spread, crackers, cookies, cocoa, accessory packet D, spoon.

Menu 2: Ham and chicken loaf, strawberries, peanut butter, crackers, pineapple nut cake, accessory packet A, spoon.

Menu 3: Beef patties, beans in tomato sauce, cheese spread, crackers, brownies, accessory packet B, spoon.

Menu 4: Beef slices, peaches, peanut butter, crackers, cookies, accessory packet C, spoon.

Menu 5: Beef stew, fruit mix, peanut butter, crackers, cherry nut cake, cocoa, accessory packet A, spoon.

Menu 6: Frankfurters, beans in tomato sauce, jelly, crackers, cocoa, accessory packet E, spoon.

Menu 7: Diced turkey with gravy, potato patties, jelly, crackers, maple nut cake, cocoa, accessory packet A, spoon.

Menu 8: Diced beef with gravy, beans in tomato sauce, cheese spread, crackers, brownies, accessory packet A, spoon.

Menu 9: Beef or Chicken a la King, cheese spread, crackers, fruit cake, cocoa, accessory packet D, spoon.

Menu 10: Meatballs in BBQ sauce, potato patties, jelly, crackers, chocolate nut cake, cocoa, accessory packet A, spoon.

Menu 11: Ham slices, peaches, cheese spread, crackers, orange nut cake, cocoa, accessory packet A, spoon.

Menu 12: Chicken loaf or ground beef in spice sauce, strawberries, peanut butter, crackers, cookies, accessory packet C, spoon.

The accessory packets contain:

A: Coffee, cream substitute, sugar, salt, gum, matches, toilet tissue.

B: Coffee, cream substitute, sugar, candy, soup and gravy base, salt, gum, matches, toilet tissue.

C: Coffee, cream substitute, sugar, candy, salt, gum, matches, toilet tissue.

D: Coffee, cream substitute, sugar, ketchup (powdered), salt, gum, matches, toilet tissue.

E: Coffee, cream substitute, sugar, candy, ketchup (powdered), salt, gum, matches, toilet tissue.

The candy found in these accessory packets can be either a caramel bar, a chocolate fudge bar, chocolate with almonds, or vanilla fudge bar.

The 12 new menus are as follows:

All menus contain a beverage base, an accessory packet, a pouch stand, and a spoon.

Menu 1: Pork with rice in BBQ sauce, applesauce, jelly, crackers, candy, cocoa.

Menu 2: Corned beef hash, pears, jelly, crackers, oatmeal cookie bar, cocoa.

Menu 3: Chicken stew, peaches, peanut butter, crackers, candy, cocoa.

Menu 4: Ham omelet, potato, cheese spread, crackers, oatmeal cookie bar, cocoa.

Menu 5: Spaghetti with meat sauce, cheese spread, crackers, maple nut cake.

Menu 6: Chicken a la King, pineapple, peanut butter, crackers, cocoa.

Menu 7: Beef stew, peanut butter, crackers, cherry nut cake.

Menu 8: Ham slice, potato, jelly, crackers, brownie, cocoa.

Menu 9: Meatballs with rice, fruit mix, peanut butter, crackers, cookie.

Menu 10: Tuna with noodles, cheese spread, crackers, chocolate nut cake.

Menu 11: Chicken with rice, peaches, cheese spread, crackers, cookie/candy.

Menu 12: Ham with scalloped potatoes, applesauce, jelly, crackers, brownie, cocoa.

The new accessory packet consists of coffee, cream substitute, sugar, salt, gum, matches, and toilet tissue.

—Fred C. Kiesche

PART II: DINING AT THE MR-EATERY/REVIEW

As part of its continuing campaign to acquaint **Twilight: 2000** players with aspects of military life, we decided a short treatise on this widely despised product was called for. A friend supplied me with a Menu-9 MRE (Chicken a la King), but I understand that they can be had from military surplus and outdoor supply stores at varying prices. MREs are said to vary from 1200 to 1300 calories in content and are reputed to have a shelf life of 15 years. I was assured that it was quite edible, although the outside wrapper smelled strongly of mildewed cardboard. Despite this, I decided to plunge ahead.

The al fresco atmosphere of the MRE is most refreshing in that the surroundings are whatever the diner chooses to make them. This reviewer chose to make them his own kitchen and avail himself of the various modern conveniences there (table, plates, chair, etc.). The meal was reminiscent of a number of those avant-garde steakhouses that were the vogue two or three years ago (one prepares one's own steak and thus avoids the tiresome task of figuring a proper tip). For a time, MREs were popular for school lunches at a local middle school (they quickly became passe, as all such fads do).

The meal came in a thick brown plastic envelope (four mils, for you statistics freaks), which provided an effective seal against the rather poor storage conditions from which it had recently been removed. The name of the packing company was stenciled on the outside (mine was packed by a company in Sterling Heights, Michigan) along with the notation "Meal, Ready-to-Eat, Individual" and "Menu-9 Chicken a la King, Accessory Packet D." None of the interior contents had the musty smell of the outer wrapper, which encouraged me considerably (food poisoning not being one of my favorite diseases). Upon ripping open my packet, I was presented with the following:

● A cardboard package, olive green in color, about five inches by five inches by one-half inch, labeled "Chicken a la King" along with a listing of contents, an address of another packing company, and an inspection stamp from the US Department of Agriculture.

● Another cardboard package, same dimensions, labeled "Fruitcake" and giving a bakery's address and also listing contents.

● A dark brown foil packet about five inches square, labeled "Crackers."

● An OD green foil packet about three inches by five inches, labeled "Cheese Spread," listing the ingredients (leading off with "Cheddar Cheese") and the instructions to knead the contents before opening.

● An OD green foil packet about four inches × five inches, labeled "Cocoa" and listing ingredients and instructions on how to mix it into water for a hot or cold drink.

● Accessory packet D, contents detailed above.

● A white plastic spoon, wrapped in transparent plastic.

Opening the two cardboard packages, I found within them two heavy OD green foil packets, each labeled with its contents. I was instructed to inspect the packets and not eat the food if the foil packets were bulging or punctured (which would indicate spoilage). I chose to heat the entree in my microwave oven to save time (removing it from the foil packet first, otherwise it wouldn't work), although I understand the suggested method is to heat the packet in boiling water. While the chicken was heating, I opened the fruitcake packet and ate it cold (I was later told that most people eat the dessert first, so I am not alone in my gluttony). The fruitcake was not at all dry as I expected, and had a pleasant taste. I've gotten worse for Christmas.

As the chicken cooled (the microwave got it too hot to eat), I heated a cup of water for the cocoa and opened the crackers. These were about five inches square and were rather crumbly (mine were intact, but crumbling on the edges and corners, reminding me more of shoddy masonry than something edible). I kneaded the cheese spread packet to mix the contents and tore off one corner per instructions; then I squeezed the mixture over the crackers. The cheese spread was brownish-yellow and not particularly appetizing in appearance. It had a rather acrid, albeit cheddar-like taste, which, combined with the taste of the crackers (a unique blend of matzos and styrofoam), was vaguely unpleasant but not inedible.

The entree tasted like a medium-priced frozen TV dinner (being a bachelor, I have considerable acquaintance with these). The chicken was chewy but not stringy, the sauce was pleasant (if bland), and the vegetables still had a nice taste. Nothing to write home about, but if I were in the situation represented by **Twilight: 2000** and had been living off squirrels and roasted skunk rump for a year or so, it would have been ambrosia.

The cocoa powder dissolved very rapidly and with a minimum amount of stirring. It was thick, foamy, and tasted very good, easily as good as the stuff you can buy in grocery stores (I am inclined to suspect it *is* the same stuff you can buy in grocery stores, knowing what I do of military procurement policies).

My accessory packet (D) contained no candy, contrary to Fred's listing above. The coffee tasted acidic and brackish. The cream substitute helped it a little. The chewing gum cleaned the taste of the coffee out of my mouth. I did not try anything else.

In summation, I can't say anything about the nutritional value of the whole thing; however, considering that the meal had been sitting on a shelf in a basement for one or two years without any refrigeration, it was in very good shape (and few foods other than canned goods can still be eaten after standing up to treatment like that). MREs might make an amusing "theme" appropriate for a dinner gathering of **Twilight:**

2000 players (although veterans might object, having eaten enough of them in their lives...military food is universally despised). All in all, I don't plan on making a steady diet of them, but they seem to be an improvement over the older K and C rations (although I have never eaten these). I wish they had these things back when I was a Boy Scout.

—*Loren K. Wiseman*

Equipment List

AMX-10RC: A French-built six-wheeled amphibious armored car. The AMX-10RC is more of a wheeled light tank than armored car. There is a driver's hatch on the left side of the front deck and hatches for the commander and loader on the turret deck. The gunner uses the commander's hatch. *Price:* $100,000 (R/R) *RF:* +40 *Armament:* 105mm gun MAG MG *Ammo:* 38 × 105mm *Tr Mov:* 160/100 *Com Mov:* 55/35 *Fuel Cap:* 400 liters *Fuel Cons:* 160 liters *Load:* 800 kg *Fuel Type:* D, A *Veh Wt:* 15.8 tons *Crew:* 4 *Mnt:* 8.
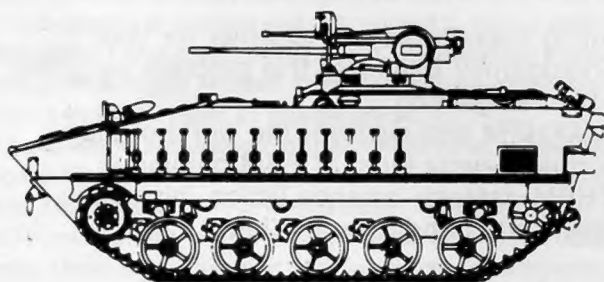
AMX-10P: A French-built tracked infantry fighting vehicle. Main entrance to the passenger compartment is by a large drop ramp in the rear of the vehicle. There's a hatch on the left front deck for the driver and a hatch for the commander on top of the turret. *Price:* $100,000 (S/R) *Armament:* 20mm Autocannon *Ammo:* 300 × 20mm *Tr Mov:* 120/70 *Com Mov:* 40/30 *Fuel Cap:* 526 liters *Fuel Cons:* 130 liters *Load:* 2 tons *Veh Wt:* 13 tons *Fuel Type:* D, A *Crew:* 2 + 9 *Mnt:* 8.
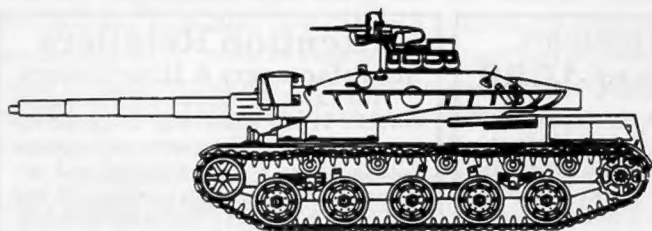
AMX-30S: A French-built tracked main battle tank. There is a driver's hatch on the left front deck and commander's and loader's hatches on the turret deck. A weapons mount (C) is located by the commander's hatch. *Price:* $400,000 (R/R) *RF:* +15 *Armament:* 105mm gun, MAG MG M2HB (C) *Ammo:* 50 × 105mm *Tr Mov:* 130/100 *Com Mov:* 45/35 *Fuel Cap:* 970 liters *Fuel Cons:* 350 liters *Load:* 500 kg *Fuel Type:* D, G, AvG, A *Veh Wt:* 36 tons *Crew:* 4 *Mnt:* 16.
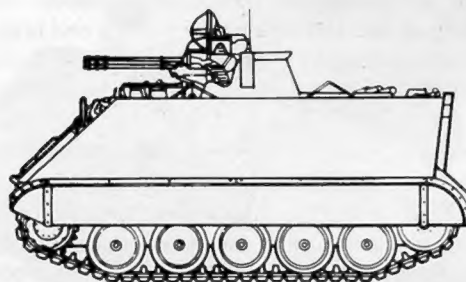
M741A6 PIVAD: Another antiaircraft weapon, an M113 fitted with a PIVAD system. Aside from the weapon, which replaces the commander's hatch, it is nearly identical to the M113 APC in the equipment list. *Price:* $75,000 (R/R) *Armament:* Vulcan 20mm ADA Autocannon *Ammo:* 1800 × 20mm *Tr Mov:* 120/70 *Com Mov:* 40/30 *Fuel Cap:* 360 *Fuel Cons:* 120 *Fuel Type:* D, A *Load:* 20 kg *Veh Wt:* 11 tons *Crew:* 3 *Mnt:* 8
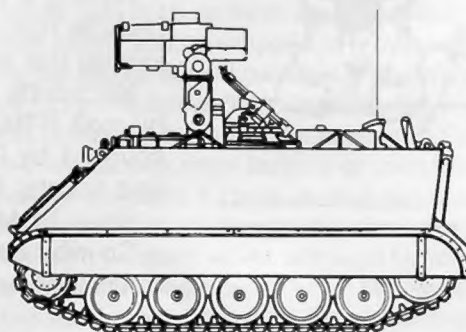
M901 ITV: Yet another variant of the M113 chassis, the ITV (Improved TOW Vehicle) was designed to replace earlier TOW carriers (hence the name). The TOW launcher replaces the commander's hatch, and automatic reloading machinery largely fills the rear crew compartment. Otherwise the vehicle is as the M113 in the equipment list. *Price:* $75,000 (S/R) *RF:* +15 *Armament:* TOW Launcher (twin) *Ammo:* 10 TOW II missiles *Tr Mov:* 120/70 *Com Mov:* 40/30 *Fuel Cap:* 360 *Fuel Cons:* 120 *Fuel Type:* D, A *Load:* 700 kg *Veh Wt:* 11 tons *Crew:* 3 *Mnt:* 6
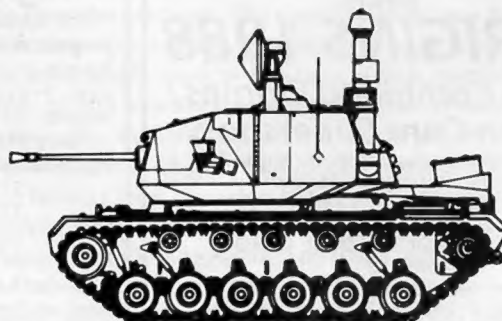
M-988: Also known as the Sergeant York or DIVAD (Divisional Air Defense gun), the M-988 is a tracked, self-propelled air

defense gun. It has a commander's hatch and a gunner's hatch on the turret deck and a driver's hatch in the middle of the front deck. In the mid-1980s, production ceased. *Price:* $100,000 (R/R) *RF:* +15 *Armament:* Twin 40mm autocannons *Ammo:* 233 × 40mm *Tr Mov:* 100/60 *Com Mov:* 35/25 *Fuel Cap:* 1400 *Fuel Type:* D, A *Fuel Cons:* 280 *Load:* 500 kg *Veh Wt:* 48 tons *Crew:* 3 *Mnt:* 12
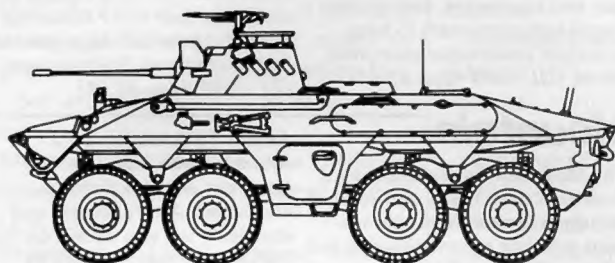
Spahpanzer Luchs: Designed and built about the same time as the Tpz1, the *Luchs* (lynx) is a six-wheeled amphibious recon vehicle which shares some common components with the Tpz1. Its layout is rather odd in that it has two drivers, one front and one back, both with hatches on the front and rear deck respectively (each has a corresponding NLT mount, but guns are seldom fitted in these positions). The commander and gunner ride in the turret, which has a single hatch mounting a light machinegun (C). *Price:* $80,000 (R/R) *Armament:* 20mm Autocannon, MG3 MG *Ammo:* 300 × 20mm *Tr Mov:* 200/80 *Com Mov:* 70/30 *Fuel Cap:* 320 liters *Fuel Cons:* 160 liters *Load:* 2000 kg *Fuel Type:* D, A *Veh Wt:* 19.5 tons *Crew:* 4 *Mnt:* 13
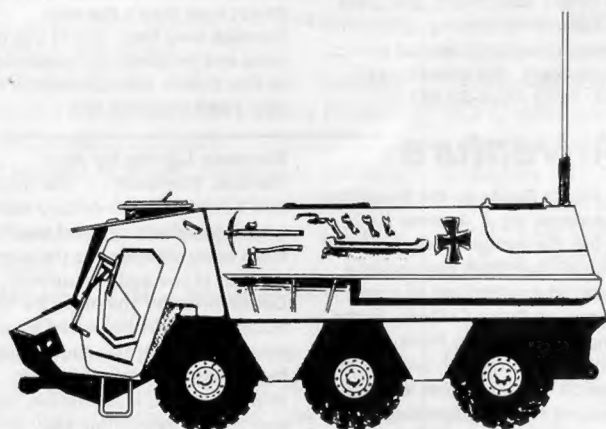
Tpz 1 (Transportpanzer) Fuchs: The *Fuchs* (fox) is a six-wheeled, fully amphibious APC built by the Federal Republic of Germany, and is in service with the *Bundeswehr*, although by 2000 the vehicle is definitely showing its age. There are hatches on the left front deck (for the driver) and the right front deck (for the commander) with a weapon mount (C). The front compartment has doors on both sides; the rear compartment has one firing port on each side and double doors at the rear for boarding/departure of the passengers (the right rear door also has a firing port). A circular roof hatch on the center of the deck is sometimes fitted with a heavy weapon (NHT mount). Several variants exist, including a mortar carrier and an NBC vehicle. *Price:* $250,000 (C/S) *Armament:* MG3 MG *Tr Mov:* 200/60 *Com Mov:* 70/25 *Fuel Cap:* 400 liters *Fuel Cons:* 170 liters *Load:* 10 tons *Fuel Type:* D, G, A *Veh Wt:* 15.9 tons *Crew:* 2 + 10 *Mnt:* 14
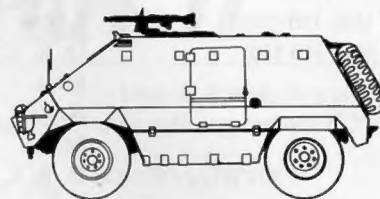
UR-416: A four-wheeled light APC in service with the *Bundeswehr* and West German police forces. There are two deck hatches, one front (with a NLT mount) and one rear. One door on each side and one in the rear provide for rapid passenger access. The vehicle has five firing ports on each side and two on the rear. *Price:* $100,000 (C/S) *Armament:* MG3 MG *Tr Mov:* 160/60 *Com Mov:* 60/40 *Fuel Cap:* 150 liters *Fuel Cons:* 80 liters *Load:* 2000 kg *Fuel Type:* D, G, A *Veh Wt:* 6.3 tons *Crew:* 2 + 8 *Mnt:* 12

AMX-10RC

|	
R: LH (25), G (30), HB (15)	D, R, G, E, F
L: LH (25), G (30), HB (15)	D, L, S, E, F
R: TF (25), TB (15)	G, C, A
C: TF (25), TB (15)	X, W, N, A
L: TF (25), TB (15)	L, A
TS: (15)	L, C, G, W, A, X
F: HS (10)	D, R
C: HS (10)	L, G, S
R: HS (10)	E, F
FD (10)	D, R
TD (10)	X, W, C, G, L, N, S, A
BD (10)	F, E, A

AMX 10P

R: LH (15), G (15), HB (15)	E, F, P
L: LH (15), G (15), HB (15)	D, R, P
R: TF, TB	Miss
C: TF (15), TB (10)	W, G
L: TF, TB	Miss
TS:	Miss
F: HS (10)	D, E, F
C: HS (10)	G, S, P
R: HS (10)	S, P
FD (10)	D, E, F
TD (10)	W, G
BD (10)	P, S

AMX-30S

R: LH (75), G (25O), HB (75)	D, R, G, E, F
L: LH (75), G (250), HB (75)	D, L, S, E, F
R: TF (25O), TB (40)	G, C, A
C: TF (25O), TB (40)	X, W, N, A
L: TF (250), TB (40)	L, A
TS (40)	L, C, G, W, A, X
F: HS (4O)	D, R
C: HS (40)	L, G, S
R: HS (40)	E, F
FD (25)	D, R
TD (25)	X, W, C, G, L, N, S, A
BD (25)	F, E, A

M901 ITV

R: LH (30), G (30), HB (10)	E, F, P
L: LH (30), G (30), HB (10)	D, R, C
R & L TF, TB	Miss
C: TF (10), TB (10)	N, M
TS (30)	M, N
F: HS (10)	D, R, C
C: HS (10)	P, S
B: HS (10)	L, A
FD (10)	D, R, C
TD (0)	M
BD (10)	L, A

M741A6 PIVAD

R: LH (30), G (30), HB (10)	E, F, P
L: LH (30), G (30), HB (10)	D, R, P
R: TF (20), TB (10)	N, W, G
C: TF (20), TB (10)	W, N, A, L
L: TF (20), TB (10)	C, W, L, G
TS (10)	C, W, G
F: HS (10)	D, E, F
C: HS (10)	G, S, P
B: HS (10)	S, P
FD (10)	D, E, F
TD (10)	W, G
BD (10)	P, S

SPAHPANZER LUCHS

R: LH (30), G (50), HB (25)	E, F, P
L: LH (30), G (50), HB (25)	E, F, P
R&L: TF, TB	Miss
C: TS (30), TF (40), TB (30)	
F: HS (30)	D, R
C: HS (30)	G, C, A
B: HS (30)	D, E, F
FD (20)	D, R
TD (20)	X, W, N, G, C
BD (20)	D, E, F

TPZ1 FUCHS

R: LH (30), G (40), HB (10)	E, F, P
L: LH (30), G (40), HB (10)	E, F, P
R, C, L: TF, TB	Miss
F: HS (20)	D, C
C: HS (20)	G, S, P, E, F
B: HS (20)	S, P
FD (10)	D, C
TD (10)	S, P, E, F
BD (10)	S, P

UR-416

R: LH (20), G (30), HB (5)	E, F, P
L: LH (20), G (30), HB (5)	E, F, P
R, C, L: TF, TB	Miss
F: HS (10)	D, E, F, C
C: HS (10)	G, S, P
B: HS (10)	S, P
FD (5)	D, E, F, C
TD (5)	S, P
BD (5)	S, P

—Steve Arrowsmith and Paul Emerson

USSR: 2000, Part II

The results of the nuclear strikes on the USSR have already been dealt with in a previous article. Here, we have provided a simple listing of targets and bombs. As with other articles of this sort, the dots on the map are not meant to represent craters or areas of radioactivity, but are just there to show approximate location.

Moscow, RSFSR: Moscow Military District HQ, Moscow Air Defense District HQ (6 × 500kt).

Leningrad, RSFSR: Leningrad Military District HQ, Leningrad Military Production Center (3 × 300kt).

Kiyev, UkSSR: Kiyev Military District HQ, Kiyev Military Production Center (1 × 500kt).

Sverdlovsk, RSFSR: Ural Military District HQ, Ural Military Production Center (2 × 500kt).

Tblisi, GSSR: Transcaucasus Military District HQ, petroleum production and refining facilities, Su-25 Airframe Plant (3 × 300kt).

Baku, ASSR: Baku Air Defense District HQ, petroleum production and refining facilities (6 × 300kt).

Minsk, BSSR: Belorussian Military District HQ, Belorussian Military Production Center, (3 × 300kt).

Tashkent, UzSSR: Turkestan Military District HQ, Southern TVD HQ, (500kt).

L'vov, UkSSR: Carpathian Military District HQ (3 × 200kt).

Alma-Ata, KSSR: Central Asian Military District (1 × 500kt).

Rostov-na-Donu. RSFSR: North Caucasus Military District HQ, North Caucasus Military Production Center (1Mt).

Novosibirsk, RSFSR: Siberian Military District (500kt).

Chita, RSFSR: Transbiakal Military District HQ, Transbiakal Military Production Center (500kt)

Kuybyshev RSFSR: Volga Military District HQ, Volga Military Production Center, petroleum production and refining facilities (6 × 500kt).

Plesetsk, RSFSR: Recon satellite launching facilities (1Mt).

Leninsk-Tyuratam, KSSR: Recon satellite launching facilities (2 × 1Mt).

Kapustin Yar, RSFSR: Secondary satellite launching facilities (500kt).

Ramenskoye, RSFSR: Aircraft test facilities (300kt).

Sary-Shagan, KSSR: Energy weapons research facility (2Mt)

Mukachevco, UkSSR: ABM radar site (250kt).

Murmansk-Severdmorsk, RSFSR: Red Banner Northern Fleet HQ, SLBM storage center, naval storage base (3 × 500kt).

Kaliningrad RSFSR: Baltic Fleet HQ (300kt).

Sevastopol, UkSSR: Black Sea Fleet HQ, port and warship construction facilities (1Mt).

Nikolayev, UkSSR: Port and warship construction facilities, ABM radar site (1Mt).

Vladivostok, RSFSR: Pacific Fleet HQ (6 × 300kt).

Komsomol'sk, RSFSR: Komsomol'sk Military Production Center (2 × 500kt)

Petropavlovsk, RSFSR: Submarine base SLBM storage center (2 × 1Mt ground burst)

Pervomaysk, UkSSR: SS-19 ICBM Complex HQ (2 × Mt ground burst).

Teykovo, RSFSR: SS-27 ICBM Complex HQ (2 × Mt ground burst).

Kostroma, RSFSR: SS-17 ICBM Complex HQ (2 × Mt ground burst).

Dombarovskiy, RSFSR: SS-18 ICBM Complex HQ (2 × Mt ground burst).

Kartaly, RSFSR: SS-18 ICBM Complex HQ (2 × Mt ground burst).

Aleysk, RSFSR: SS-18 ICBM Complex HQ (2 × Mt ground burst).

Uzhur, RSFSR: SS-18 ICBM Complex HQ (2 × Mt ground burst).

Olovyanneya, RSFSR: SS-26 ICBM Complex HQ (2 × Mt ground burst).

Svobodnyy, RSFSR: SS-26 ICBM Complex HQ (2 × Mt ground burst).

Yoshskar-Ola, RSFSR: SS-25 ICBM Complex HQ (2 × Mt ground burst).

Perm, RSFSR: SS-26 ICBM Complex HQ (2 × Mt ground burst).

Volgograd, RSFSR: Petroleum production and refining facilities, Volgograd Military Production Center (3x500kt)

Astrakhan, RSFSR: Petroleum production and refining facilities (3 × 300kt).

Nizhniy Tagil, RSFSR: Military Production Center (1Mt).

Syzran, RSFSR: Petroleum production and refining facilities (2 × 500kt).

Omsk, RSFSR: Transportation hub (500kt).

Irkutsk, RSFSR: Petroleum production and refining facilities (3 × 500kt).

ABBREVIATIONS

RSFSR: Russian Soviet Federated Socialist Republic.

UkSSR: Ukrainian Soviet Socialist Republic.

KSSR: Kazakh Soviet Socialist Republic.

GSSR: Georgian Soviet Socialist Republic.

ASSR: Azerbaijan Soviet Socialist Republic.

BSSR: Belorussian Soviet Socialist Republic.

UzSSR: Uzbek Soviet Socialist Republic.

—*Frank Frey and Loren Wiseman*

SOVIET NUCLEAR TARGETS

Scale of Miles

0   300   600
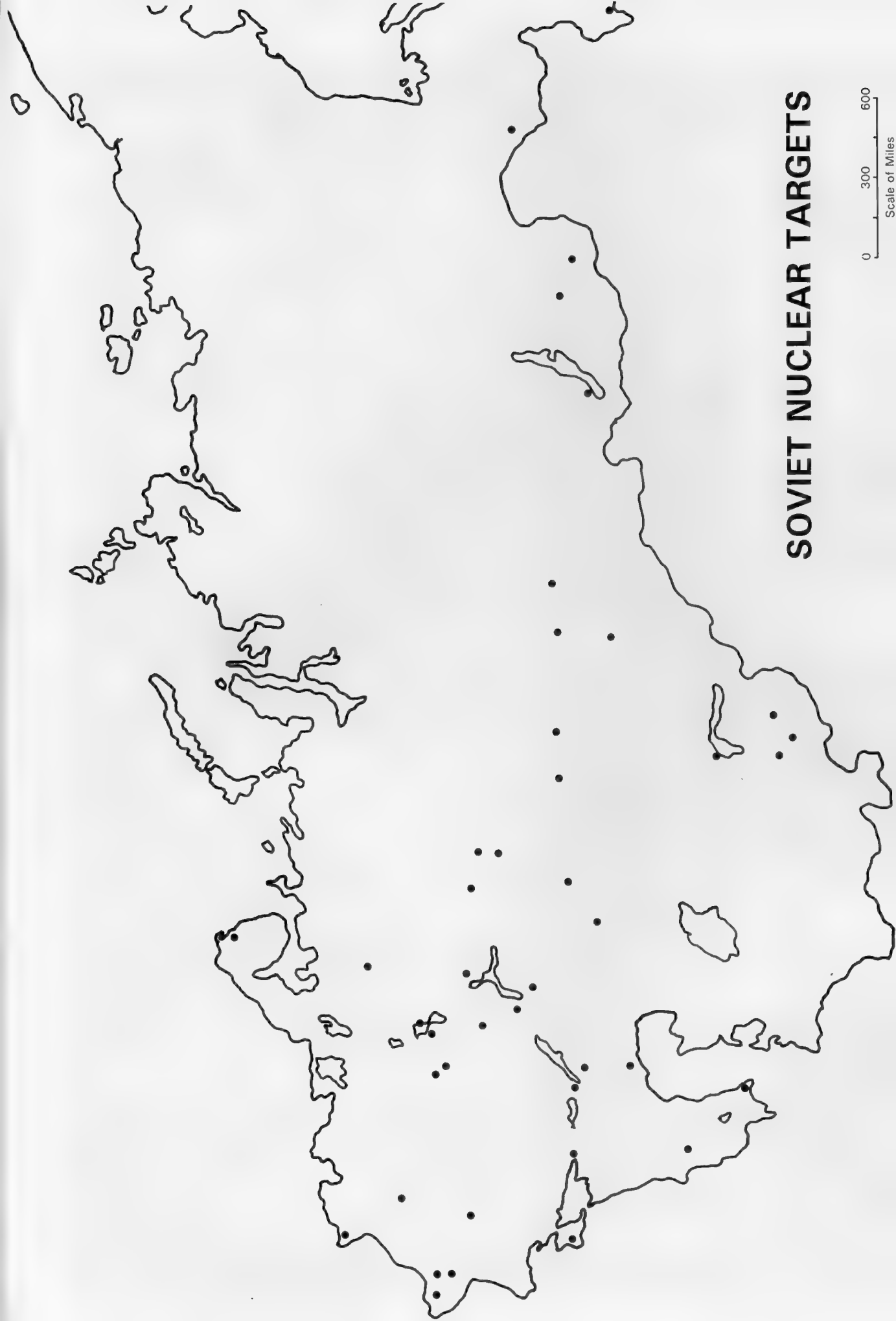
Twilight Survey

GDW asks that players and referees of **Twilight: 2000** answer the questions below. This will enable us to tailor our upcoming product releases more closely to consumer preferences and help us to improve the **Twilight: 2000** product line.

Respondents unwilling to remove this page from their magazine should either photocopy it or use a separate sheet of paper (numbering their responses in the same order as the questions).

1. Are you a: Player ☐ Referee ☐ Both ☐

2. Please indicate which of the products in the **Twilight: 2000** line you own or have examined in enough detail to be familiar with. Also indicate which ones you have played.

	Own	Have Seen	Have Played
Twilight: 2000 Basic Game	☐	☐	☐
The Free City of Krakow	☐	☐	☐
Pirates of the Vistula	☐	☐	☐
Ruins of Warsaw	☐	☐	☐
US Army Vehicle Guide	☐	☐	☐
Going Home	☐	☐	☐
Red Star/Lone Star	☐	☐	☐
RDF Sourcebook	☐	☐	☐
The Black Madonna	☐	☐	☐
Allegheny Uprising	☐	☐	☐
Airlords of the Ozarks	☐	☐	☐
Spanish Main	☐	☐	☐
King's Ransom	☐	☐	☐
Soviet Vehicle Guide	☐	☐	☐
Urban Guerilla	☐	☐	☐
Small Arms Guide	☐	☐	☐

3. What **Twilight: 2000** product do you like the best and why?

4. What **Twilight: 2000** product do you like the least and why?

5. As a player, what kind of adventure situations do you most enjoy playing? What is it about these that you enjoy?

6. As a referee, what kind of adventure situations do you most enjoy running? What is it about these that you enjoy?

7. Of the geographic locations not yet covered, which would you like to see covered in sourcebooks and adventures? What is it about these locales that attracts your interest?

8. Of the geographic settings covered in the sourcebooks and adventures listed above, which do you like the most? What is it about these locales that attracts your interest? For which of these would you most like to see more adventures published?

9. What products would you like GDW to produce for **Twilight: 2000**?

10. What is it you like about **Twilight: 2000**?

11. What would you like to see done differently about **Twilight: 2000**?

12. If you have any other remarks about **Twilight: 2000** or any of its subsidiary products, please write them below. Use another sheet of paper if you need to.

—Loren K. Wiseman

TRAVELLER NEWS SERVICE

AMDANI/DAIBEI (2014-A727A88-E) Date: 341-1117

¶ Imperial forces retreating ahead of the advancing Solomani Fleet made a stand this week in Laudumash and Amdani, and fought the Solomani to a standstill.

¶ A naval spokesperson expressed a feeling of confidence that the invaders would be forced from Daibei sector by the end of the year.

HINDAHL/OLD EXPANSES (1422-A754A86-B) Date: 224-1117

¶ Sector naval headquarters today announced the transfer of the Old Expanses Fleet to Zarushagar for operations against the usurper, Dulinor. The brief announcement from headquarters indicated that all of the first-line fleets would be transferred within 60 days.

¶ "The defense of the sector lies in the capable hands of our reserve squadrons," Sector Admiral Hinchcliffe said at the press conference which revealed the arrival of the Transfer Order from Emperor Lucan.

HINDAHL/OLD EXPANSES (1422-A754A86-B) Date: 350-1117

¶ In the face of continued Solomani fleet actions, a rise in Solomani political activity in the sector, and a lack of defenses for the region, a coalition of Dukes within the Old Expanses today announced the voluntary incorporation of the sector into the Solomani Confederation.

¶ A spokesperson indicated that the Confederation had made certain guarantees to the region, and that no immediate changes in local government were contemplated.

¶ The Transfer Order reached Corridor on 221-1117. Corridor Fleet, vastly overstrength for the territory it patrolled, was staffed by personnel from throughout the Imperium.

¶ Its mission, one it had pursued for centuries, was to protect the passage through Corridor of Imperial commerce and communications.

¶ Although abandoning the mission was difficult, the strength of an Imperial order and the crisis facing the Empire made the Fleet's crew anxious to comply.

DEPOT/CORRIDOR (1511-A686354-F) Date: 221-1117

¶ The Naval High Command of Corridor Fleet today announced the arrival of Emperor Lucan's Transfer Order.

¶ To help save the Imperium from the rebel Dulinor, the announcement said, Corridor Fleet is to transfer to Zarushagar within a month.

¶ Local authorities expressed confidence that sufficient assets would remain in Corridor sector to defend the region against Vargr raids.

DEPOT/CORRIDOR (1511-A686354-F) Date: 242-1117

¶ The assembled Corridor Fleet departed on its voyage to Zarushagar sector today, leaving defense of the sector to a scattering of reserve squadrons.

¶ Extensive plans for continued border patrols and preemptive operations "virtually guarantee" the security of the sector, according to a highly placed naval official.

DEPOT/CORRIDOR (1511-A686354-F) Date: 318-1117

¶ Reports of a strong Vargr raid on Khukish last week were dismissed by naval authorities at Depot today as exaggerated.

¶ "We constantly receive reports of Vargr raids, and they always turn out to be isolated incidents of little importance. The Vargr would never dare a major operation into this sector," according to Commander Lynx Breneri of the Naval Information Office.

KHUKISH/CORRIDOR (1606-A77A989-F) Date:320-1117

¶ Khukish Naval High Command today announced the withdrawal of the Khukish 984th Naval Reserve Squadron from border patrol duty.

¶ "After last week, it is clear that the 984th is more urgently needed in defense of the home system," according to Admiral Dwayne Fomish of the System Tactic Developments Command on Khukish.

¶ Several neighboring systems are considering similar moves.

¶ When the local coordination officer for the Imperial Navy protested the withdrawal, he was placed under house arrest. It is reported that the officer fled the Khukish system later in the day.

Lone Wolf

The following account is based on data from the frigate *Faucon*. The data was squirt transmitted to, and delivered by, Courrier de Flotte *Joyeusse*, the sole survivor of the encounter off Hochbaden.

Capitaine de Vaisseau Raoul de Lombard settled back into his control couch with a sense of deep satisfaction. The promotion befitting his new assignment as convoy commander had come through only the day before, and arriere-garde *Joyeusse* had just called to confirm that she had herded the last of the civilian freighters into formation. The civilian shipmasters were a headstrong, uncooperative lot, but now, as the seven-ship convoy approached the .0001G gradient, they had finally surrendered their objections to military discipline. The convoy would get off on time after all, and his first assignment was well on its way to a successful conclusion.

Faucon's cramped but efficient bridge hummed and bleeped its song of well-being and soothed Lombard into peacefulness.

Until his sensors officer blurted, "Quoi?"

"What is it, Enseigne?"

"Large unidentified target, sir, off the port quarter, bearing 235, positive 30."

Lombard's head snapped toward his communications officer. "Check incoming traffic reports. Are any major units due in?"

"Capitaine," the sensors officer interrupted, "Neutrino sensor indicates a fusion drive in the hundred megawatt range; spectral sensors indicate ablative screens are erected. I don't think it's one of ours."

"Have we been spotted?"

Radar warning alarms blared from several locations around the bridge.

"We have been now, sir. We are being painted by several radars in the search and fire control bands. Wave form indicates Kafer equipment."

"Merde," Lombard snapped. "Sound battle stations. Sensors, go active; make a complete spherical scan; make sure there's only one of those things."

"Affirmative, sir. However, several smaller targets coming into view around the large Kafer. Suggest they're fighters or missiles, sir."

"Send to merchants: 'Make best possi-

ble speed course 55 degrees relative. Will engage hostile vessel.' Though I doubt we'll be able to stop them—not all of them, anyway."

"Weapons showing manned and ready, sir."

"All mounts open fire. Fire on best possible solution."

Lombard drummed his fingers on his console. The tactical plot showed the five merchants scattering, their newfound discipline shattered. *Faucon* seemed to throb with each salvo of her weapons.

"No appreciable damage to target, sir; she's pretty heavily protected. Small targets have resolved as fighters and are splitting up to pursue freighters."

"A Dieu ne plaise! Make broad-band distress to all ships in system. Tell *Joyeusse* to break off and to receive squirt transmission. I want all sensor data on the Kafer and all records to be prepared for squirt. Someone has to get the details out, and only *Joyeusse* has the speed."

More alarms jangled.

"Capitaine, am receiving avionics broadcasts. Probably mid-course corrections for X-ray-type missiles. IR is picking them up now, sir."

"Is the squirt transmission ready?"

"Yes, sir."

"Begin transmitting. Add 'Vive la France.' Keep the guns firing on the Kafer ship, not the missiles. If we can't get him, we're dead anyway."

Nearby, several thermonuclear warheads blossomed silently against the blackness and were focused into invisible knives that sliced deep into *Faucon*'s belly. She flared brightly and became an expanding cloud of gas.

As the freighters came under fire from the pursuing fighters, *Joyeusse* darted away through the void.

OVERVIEW

The long-feared threat has materialized. One or more Kafer warships are loose in human space, preying on supply and communications routes. Losses have been most severe to French, German, and Ukrainian interests, but alarmist voices on Earth have begun suggesting that the survival of humanity may be at stake.

Humanity's interstellar age has thus far

been marked by the extension of national rivalries into the frontiers of space, as age-old conflicts and dislikes have burst into open warfare over colonial territories or access to certain commodities. The boundaries of human language and culture continue to be persuasive to many government or armed forces leaders, but this seems to be changing. Humanity is finally threatened by another species, one which bears all the signs of being implacable, malevolent, and wholly incomprehensible. While generations of philosophers and statesmen have predicted the revolutionary effects of such an external threat, it is still stunning how the Kafer menace promises to turn the "family of man" into more than a pretty phrase. On Earth, the popular sentiment, as endlessly reported and rereported by the global media, is that the 19 Starfaring Nations should unite to face the threat in the name of mankind. This view has been particularly persuasive in the United States, which has become the first nation not involved in the French Arm to send military forces to the engaged area. Australian forces, integrated into the American Arm, are also present in the French Arm, as are starships from Britain, Azania, and Japan, as well as a fighter group from Texas.

As this human fleet, under the still unofficial protocols of Les Forces Humaines, continues to assemble at Eta Bootis, the casual observer might imagine that a unified human race faces the alien threat. This, however, would be incorrect. Crises, even one so profound as an interspecies conflict, have traditionally been seen by governments as opportunities for the bold. Many military forces in the French Arm are present for purposes of national prestige or to take advantage of the chaos in this embattled region. Were French fortunes to take a serious reverse, other national forces might be well-placed to snap up territories "in need of protection."

The protocols of Les Forces Humaines consist centrally of an equivalency listing of international military ranks so that proper courtesies can be paid by one national force to another. While the subordination of various national fleets to one international command has not yet been

Ship Status Sheet

Retief Class
Ship Name

Recce Courier
Ship Type

America
Owning Nation or World

Movement	9	Radial Reflected	4	Radial Profile	−1
Screens	0	Lateral Reflected	4	Lateral Profile	−1
Radiated Signature	5	Targetting Computer	+2	Armor	0

Hull Hits

Minor
Major

Power Plant Hits

Inoperable

Surface Fixture Hits

—Weapons—

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
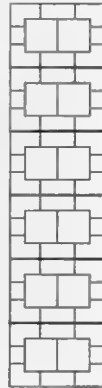
—TTAs and Submunitions—
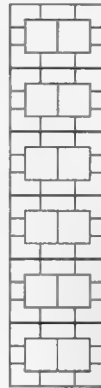
1. TTA
2. Big Clip
3. Grape Shot
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____
21. _____
22. _____

—Active Sensors—

Primary
Redundant

—Passive Sensors— 10

Primary
Redundant

Critical Hits

—Computer—

Primary

—Life Support—
—Drive—
—Hangar Deck—
—Missile Bay—
—Continuous—

—Tactical Action Center—
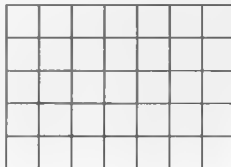
Active Operator	Fire Cntrl
Passive Operator	
DSS. Grav	
Fire Cntrl	

—Bridge—

Captain	Engineer
Navigator	Computer
Communications	Commo

Damage Control

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Ordnance

(record ordnance load and type)

Crew

Comfort   0

Crew Quality

achieved, the protocols do include provisions for the integration of forces into other national fleets for short-term operations. It is as yet only poorly understood on Earth how limited and *ad hoc* these protocols truly are.

It is in this environment that steps are being taken to meet the threat of the Kafer raider. The raider seems to be one or more independently operating *Improved Alpha* battleships and has been dubbed "le loup seul" or "the lone wolf" by French naval intelligence. While the Lone Wolf could be met and destroyed by the main body of Les Forces Humaines, the human fleet can only be in one place at one time, and at any rate it is needed to defend entire solar systems and cannot be shuttled around to defend shipping against one vessel. On the other hand, convoy operations are ineffective, as the couple of escorts available to defend each of the many convoys are not capable of defeating an *Alpha* battleship.

The compromise that has been reached provides several hunter-killer groups, each hopefully powerful enough to at least slow down an *Alpha* class until help can arrive. If properly supported by couriers and supply vessels, this force should be able to cover a fairly large area and allow the fleet to remain on guard for the Kafer main body.

The Ukrainian naval forces, badly mauled in recent fighting, have elected to maintain their strength as part of the main body

of the human fleet and to support convoy operations with detached *Kiev*-class destroyers. France, Germany, and the United States, however, have each assigned cruiser divisions to the task, as well as numerous small couriers and support vessels. Each of these cruiser divisions is under independent command despite French protestations that the best results would come from unified (French) command.

For Germany as an independent contributor, the opportunity to help hunt down the raider is a chance to assert her status as a free nation against her former dominating French "ally." Germany, with many legitimate colonial interests in the Arm, cannot allow its efforts to protect its own civilians to become a mere subpoint of French strategy, especially as the Germans of Hochbaden, the site of the Wolf's first strike, were not protected by French policy. Finally, the bulk of the German navy is made of veterans of the War for German Reunification and have as much practice shooting at the French as at the Kafers.

The United States, on the other hand, has long chafed at the irritation of French ascendancy. This has rankled even worse, following the global assessment that the American Arm was tapped out, forcing the Americans to beg into someone else's sphere of influence or get out of the colony business. American international and domestic prestige would be greatly enhanced by an American force arriving in the French backyard "to pull the froggies out of the fire." Furthermore, the rambunctious American officer corps is rightly convinced that they have, in the *Kennedy* cruisers, the finest warships ever designed by humanity. And without a single space war to their credit, they are understandably unwilling to allow these "Queens of the Firing Ranges" to be sucked into French control, where the arrogant French press will claim credit for all of their virtues.

Though being the preeminent human power, the French are no less dependent on their international prestige. In order to maintain leadership, France must demonstrate that she can lead successfully. She is aware that bungling the Kafer menace could result in her fall from dominance and allow some upstart nation (the Americans or Ukrainians) or even worse, Satan himself (the Germans) to assume global leadership in the ensuing power vacuum. Three hundred years of post-Twilight leadership is at stake in front of millions of defenseless French colonists. If the French cannot lead the defense of the Arm named for them, they feel their survival as man's standard bearer is at risk. Finally, much to the German chagrin, the French command is able to point out that the first lives lost to the Wolf were the crew of the frigate *Faucon*, who died to defend the convoy and German colony. In the words of Francois 1er at Pavia, "Tous est perdu fors l'honneur" (All is lost save honor). For honor's sake the French will see that these French lives are avenged by French forces.

AVAILABLE FORCES

The Lone Wolf is a scenario for **2300 AD** and *Star Cruiser* and is intended for three players and a referee. The players will take the roles of the French, German, and American contingent commanders, while the referee adjudicates the action and controls the Kafer forces. The referee needs to remember that he is not competing with the human players but is simply controlling the Kafer forces as a disinterested administrator. While he should handle the Kafer sources as intelligently and reasonably as possible, the purpose of the scenario is to allow

The spatial relationships on this "map" bear little relationship to the 3-D placement of the stars on the *Near Star Map*. It is merely an accurate flow chart showing stutterwarp connections.

○ - Consult Tertiary Map

● - Colony
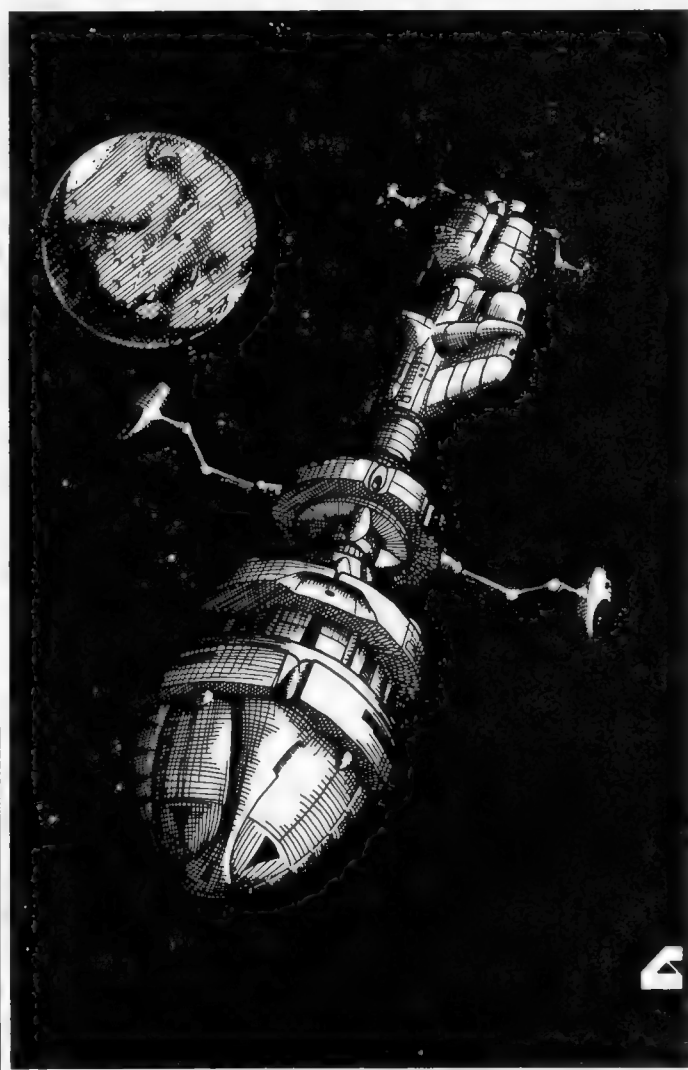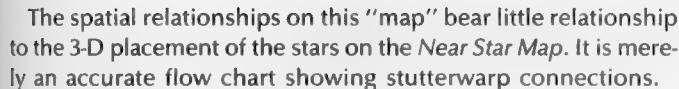
only the most experienced crews—those aboard first-line warships—can attempt this tactic. These tactics would be impossible for a fleet support ship or a civilian freighter, due to both crew quality and lack of specialized equipment.

The electronic battle is the most important battle in space; thus the tremendous military value of the DSS and gravitic sensors makes them mandatory electronic equipment on all military vessels of frigate size and larger.

The two most important issues on a commander's mind when he brings his vessel into a star system are discharging the stutterwarp and obtaining a grav scan of the system. However, it takes 21 hours to receive data from the outer limits of the 150 au range of the grav sensor. For this reason, vessels on defensive patrol of their own areas generally head to the inner system to discharge in the stellar gravity field. This allows them to cut in half the time necessary to scan the entire system by scanning from the center as compared to scanning from one edge. Conversely, vessels on offensive sweeps in enemy territory generally discharge at a planet in the outer system. While this results in a more time consuming grav scan, it allows them to avoid the more heavily trafficked inner system where the "deep well" or sphere defined by the .1G discharge gradient averages .071 au in human colonial systems.

If a vessel is feared to be lying low with stutterwarp drives shut down, a DSS search must be conducted. For purposes of this scenario, the value for the *Kennedy, Suffren,* and *Hamburg* classes are given in the Detection Ranges for Human Starships table. These values are in square astronomical units which can be covered per hour. The two-dimensional figure used as the DSS range allows coverage up to one au above and below the ecliptic plane while conducting a flat pattern. It is highly unlikely that any enemy vessel will be outside this area, as stutterwarp discharge would oblige him to venture to within less than .1 au of the ecliptic. A ship using the "All Stop" rule per *Star Cruiser* still has a running power plant and is thus still visible to the DSS at a range of one au.

Only on very rare occasions will the vessels be obliged to use their tactical sensors (i.e., the active and passive sensors listed on the Status sheets) for a search. This would only be in cases where the quarry is suspected to be powered down with the power plant shut off completely, relying on batteries for minimal functions. Active scanners cannot be used in such a search for a hostile vessel, as the active emissions serve to warn the enemy vessel to power up and get away long before his hunters are in sensor range. Passive sensors alone can be used for this purpose, as the Kafer *Alpha* has a radiated signature of one when shut down completely. A hull that size has simply too much residual radiation to be completely invisible. The range at which the three human warships can pick up the doggo Kafer are also listed on the Detection Ranges for Human Starships table. However, since the *Improved Alpha* has passive sensors superior to the human vessels, and the human vessels are maneuvering at maximum speed in order to cover the areas listed in the table, the Kafer will detect them first and have a crucial several turns to relight the power plant and ambush the human vessels. This was the tactic used off Hochbaden in the opening section of the scenario. The antique *Faucon*'s sensors were unable to pick up the powering-up Kafer before action was forced upon her.

Friendly forces will often arrange various IFF (Identification Friend/Foe) procedures in order to recognize each other at long range. This procedure generally involves switching the stutterwarp off and on according to a prearranged pattern upon entering a system, thereby identifying itself to all friendly grav scan-equipped warships in the system. This method takes only half the time of sending and awaiting challenge/reply messages and greatly eases the difficulties of deciding which of several bogies to alter course to inspect. These stutterwarp flashes are typically arranged for several months in advance, with each day having a different prearranged pattern for identification. A variation on this pattern allows a ship to identify itself to other ships in the system with access to the "stutter code." Clever players in this scenario will discover that by *not* flashing their stutterwarps, they can keep their erstwhile "allies" in doubt as to the identity of that blip out there and perhaps draw them out of position at a critical moment.

Movement from one stellar system to another is also a matter of much military concern. As grav scanners confer to the ability to exhaustively scan any system for active enemy vessels, the only other place that hostiles can be is *en route* from one system to another. As long as ships stick fairly close to the "pipeline," or the imaginary perfectly straight line from system center to system center, they can be fairly easily intercepted by ships going the opposite direction. In military parlance the "pipeline" is known as the "sewer pipe," as "any ship with a predictable course has flushed his chances for survival." For this reason all military vessels fly a dogleg pattern when travelling from star to star. There are two types of doglegs, the first of which is the basic or defensive dogleg. Figure 1 shows the tremendous capability of a defensive dogleg, as the vessel has used all of its available 7.7 light-year range to "bend the pipeline." As there are over 63,000 au in one light-year, it is easy to see that a vessel following this course will be virtually impossible to detect during the midcourse portion of its flight. Even the grav scanner can only cover one two-thousandth of the dogleg's mid-course diameter.

However, the departure angle is the same as the arrival angle in the destination system. This eases the job of the defender who has to watch only one cone of space for incoming hostiles.

This gives rise to the improved, or offensive, dogleg, which seeks to increase the difficulty of the defender by allowing the offensive force to enter the targeted system through any approach angle, including directly opposite the direction of travel. Such a 180-degree approach angle is illustrated in Figure 2. By decreasing the departure angle to 19.4 degrees in this case, the vessel has leftover range when it arrives in the vicinity of the target system, system A. It can then use this range to maneuver into an unexpected approach angle to take defending forces by surprise. As the distance between systems increases, the ability to make involved entry maneuvers such as in Figure 2 decreases, as there is less excess endurance. However, the example in Figure 2 is conducted over a fairly lengthy six light-year distance, and the vessel has only travelled a total of 7.35 light-years by its arrival, showing a margin for error.

Two significant points should be noted in Figure 2. The first is the distance of the final approach leg of .1 light-year, or 6324 au, well in excess of any detection apparatus. It is thus virtually impossible for a ship on this course to be detected until it actually enters the system proper. The second point is that most

of the trip is made not in the pipeline, but rather on the inside of a cylinder with a diameter of 2.12 light-years. Thus two vessels only one degree apart on the perimeter of the cylinder will still be separated by 1170 au, eliminating detection as a realistic possibility.

While the offensive dogleg could just as easily be used in reverse in order to disguise the destination of a departing force, in practice this can only be done with military vessels. Civilian merchant ships, even when organized in convoys, generally lack the training and experience for this kind of sophisticated maneuver.

Since military vessels always take a longer route between stars than the minimum pipeline route, we see that the importance of high speed in warship design is not in order to make their passage from star to star faster. On the contrary, it is to allow them to waste more distance in deceptive maneuvers without arriving so late as to be useless in strategic planning. This is the point of the *Kennedy* class: It can conduct a radical offensive dogleg maneuver and arrive from an unexpected direction in a hostile system and *still* take less time to do it than any other ship that used a less circuitous course. This is known as "maneuver superiority," which is the real reason for high stutterwarp performance—not, as is so often assumed, the simple thirst for raw speed.

Departing from this same strategic philosophy, American designers have completed a new class of couriers. Most couriers in service have insufficient speed to make evasive doglegs and still deliver dispatches and communiques in a timely fashion. This has led to the frustrating situation of news arriving with the battle fleet or the commander's having to thin out his force by sending high-speed destroyers with his communications. The Americans have created a companion for their *Kennedy*s in the form of a high-speed courier, but have gone one step further by outfitting it uniquely among couriers, with a comprehensive sensor fit of DSS and grav sensors, allowing it to conduct strategic scouting and reconnaissance. These are the *Retief*-class Recce couriers which are now entering service. The first three examples, *Retief*, *Flandry*, and *Falkenberg* are available as reinforcements to the American commander (see Victory section).

While relatively short-legged in terms of unrefueled endurance, *Retief*-class couriers' speed allows for the kind of high-tempo, high-mobility operations that have been pioneered by the tacticians at the USSF Academy in New Springs, Colorado. According to the dictates of Tactical Department Head CDR Devin Tschudi, these vessels are flimsily armed and armored, not only to make them small, but also to force their commanders to, in his words, "Get the picture, get the message, and get out."

Details of the class are as follows:

AMERICAN *RETIEF*-CLASS RECCE COURIER

Original Date of Design: April 11, 2296.
First Example Laid Down: June 7, 2297.
First Example Completed: May 14, 2300.
The *Retief* is perhaps the most tightly designed vessel in human service, and is intended as the smallest package for a high-performance mission. As such, her completion and certification have taken longer than might otherwise be expected for a vessel of her size. The name-ship and her two sisters, all

in U.S. Space Force service, are incapable of many of the feats of more typical couriers: They are not streamlined for planetary landing, have a miniscule cargo capacity of 15 cubic meters/4 tons, carry no medic, and have only enough fuel for 3.16 days. However, they are among the fastest starships ever built and carry sensors sufficient for strategic intelligence gathering. Allowing a minimum effective defensive dogleg of .272 light-years, *Retief* can get in and out of any system within 6.35 light-years and grav scan a 54 au diameter sphere there for stutterwarp traces on one load of fuel. The fact that she will require specialized refueling support upon returning merely allows her to dispense with such niceties as medical capability and atmospheric streamlining. When in fleet service, these vessels are expected to revolutionize naval scouting.

Sensor Package: Passive, deep-system scan, gravitational sensors.

Crew: *Bridge:* 12 *TAC:* 4 *Engineering:* 3

Performance Characteristics: *Warp Efficiency:* 4.25 *Power Plant:* 20 MW MHD Turbine *Fuel:* 902 tons, sufficient for 3.16 days operations *Range:* 7.7 *Mass:* 1396 tons *Cargo Capacity:* 15 m³/4 tons *Comfort:* 0 *Total Life Support:* 19 *Price:* Lv58,200,000

Movement: 9 *Screens:* 0 *Radiated Signature:* 5 *Radial Reflected:* 4 *Lateral Reflected:* 4 *Targeting Computer:* +2 *Radial Profile:* −1 *Lateral Profile:* −1 *Armor:* 0 *Hull Hits:* 2/3/5 *Power Plant Hits:* 8/40 *Active Sensors:* None *Passive Sensors:* 10 *Other Systems:* 1 × TTA, 1 × Big Clip, 1 × Grape Shot Dispensers *Crew Details:* Bridge includes one Communications crew above minimum, Tac includes two Fire Control, one DSS, and Grav Sensor Operator in place of Active Operator.

The ability to maneuver in between stars with virtual invisibility means that blockades are impractical and that all interdiction of enemy traffic must be conducted within the system. In general, warships keep tabs on starships within a system by their stutterwarp traces and dispatch fighters or small starships to check out unidentified traces. In this way they avoid allowing the fleet's main body to be lured out of position by decoys that will allow an attack from another angle before the main body can recover. Naval combat is thus characteristically slow and deliberate in unfolding and often devolves to nothing more than point defense due to the difficulty of intercepting enemy units.

The only counter to this is the use of ships to "shadow" enemy vessels between stars. This is possible, as the grav scanner allows even a fast-moving distant vessel to be kept in view if the shadowing vessel responds quickly enough. Vessels equipped with only tactical scanners find shadowing to be impossible, as the tremendous speed of interstellar travel overwhelms the short range of tactical scanners. Naturally, any shadowing vessel has to have speed at least equivalent to the vessel being followed. The great range of the grav scanners makes it possible for a vessel to track another without a speed advantage, which would be necessary with more limited electronics.

Experience and tactics are the keys to successful shadowing. The most critical moment of a developing shadow comes when the targeted vessel crosses the .0001 G threshold gradient and passes into FTL pseudovelocity. If the would-be shadower is caught on the wrong side of the threshold gradient for too long, the difference in the sublight and superlight speeds will take the quarry beyond the 150 au sensor range

very quickly indeed. For example, once a vessel with warp efficiency 2 crosses the .0001 gradient, it takes less than two minutes to travel 150 au. Needless to say, the shadower would have to be very close behind the target in order to keep the stuttertrace in range. For that reason, the most common tactic of shadowers is to remain right along the threshold gradient waiting for the target to pass. If the shadower finds itself out of position, it is a fairly simple matter for it to cross over the gradient line and run along the perimeter to cut off the target still struggling deeper in the well. The grav sensor not only makes shadowing possible by allowing a vessel to keep another in sight at interstellar speeds; it enables the shadower to win the transition phase and get into position for the interstellar tracking portion of the mission. It does this by using the grav scanner to allow it to keep long-range track of its quarry so it can keep itself between the target and the .0001 gradient and follow it into FTL transit.

Ideally, courier-type vessels would be used for such work, but the vessels available are not always up to the job from a speed standpoint, and none of them carry the appropriate sensors. The new *Retief* is ideal for this task, this being one of its design capabilities. However, they will probably not become common in this role because of their limited numbers and their demanding refueling requirements.

VICTORY

The destruction of the Kafer raiding forces is the ultimate goal of the human players, and if this comes to pass, they will all share in the credit. But from the point of view of their home governments, what really matters is how much of the share of credit each national force will get. While it would be nice for each of the three human admirals to cooperate, any commander who supports his allies and allows them reap the credit will find his promising naval career prematurely ended. While nominal cooperation is the framework of this campaign, ruthless self-interest is its heart and soul. A system of victory points will assist the players in understanding their selfish motivations and allow the referee to calculate who is ahead in the public relations war.

Back on Earth, the worlds' presses and major governments are all making noble pronouncements about a common purpose and the unity of the human cause. These sentiments are not only laudable, but very popular among domestic opinion. At the same time, the civil and military leadership of France, Germany, and America insist that their forces carry away more honor and credit than do their competitors. Therefore, Perret, Bader, and Blake, the on-scene commanders, are forced into a balancing act between national self-interest and the appearance of cooperating with the counterparts. Earthwide honor and prestige will be heaped upon the nation and the forces which prosecute action against the Lone Wolf, so long as they are not witnessed to be acting contrary to the ideals of human unity. Herewith, the victory points:

- For sighting Kafer with any vessel under player's command: 1
- For taking Kafer vessel under fire: 1
- For damaging Kafer: 1
- For driving Kafer battleship away from world, convoy, etc.: 3*
- For destroying the Kafer *Alpha* battleship: 15*

- For destroying a Kafer supply vessel: 3*
- For French commander giving a direct order: −1**
- For refusing a direct French order: −2**
- For French commander having his order refused: −1**
- For failing to engage Kafer battleship with a warship of *any* size, no matter how badly outgunned: −1
- To each force not present in system when convoy or world attacked: −1
- For keeping Kafer battleship shadowed, per two days: 1
- For issuing a successful communique: 2***
- For issuing a refuted communique: −2***

* = These awards are divided among the players present who fulfilled the conditions. Ratio is up to the referee, depending upon the judgment of which force offered the most to the result. Additionally, the French player suffers −1 if he is not present at one of these events, −5 if not at battleship destruction.

** = For various political reasons, the Earth governments have allowed it to be assumed that the Forces Humaines protocols call for unified French command in times of crisis, while it is a public opinion crime for a commander to force a confrontation on this shaky precedent.

*** = Once a week the referee will offer the opportunity to issue communiques, doubtless to be used to distort events to one's own advantage. If only one player so issues, he receives 2 victory points. If, however, one or both opponents issue communiques to challenge his, each player rolls 1D6. The French player and the player who earned the most victory points that week add one to their rolls. The highest roll gets 2 victory points while the loser(s) takes −2 victory points.

There are no negative victory points for loss of a vessel in one's own command because victory points will only be lost if the player seeks to obtain a replacement. In addition to attaining victory, victory points can also be used to purchase items for use in the campaign. At any point in the turn, the player may state to the referee that he will be purchasing an item, provided he has the victory points, and the expenditure will not drive him into negative victory points.

Most ships will only be available for a duration of two weeks. This time is counted from the day they appear on the board, and they disappear after 14 days. Ships may be placed on any colony world the player chooses, but they must appear when the player's admiral is present in that system in order to receive initial orders. This is not necessary for the static fighter squadrons. They are simply defensively placed and begin defensive patrols in whatever system the player chooses. Various supplies will appear at any one colony the player chooses and will remain there until used.

3 V.P.: Ukrainian destroyer division of two *Kiev*-class destroyers (loaded with 15 Glowworm missiles each) for two weeks.

2 V.P.: A frigate division. Roll 1D6 for result below.

1-2: German *Sachsen* division of two *Sachsen* class (each with 12 SR-9 missiles) for two weeks.

3-4: French *Aconit* division of two *Aconit* class (each with 2 Ritage-2 missiles) for two weeks.

5-6: The frigate *Ypres* for two weeks. As this is a unique vessel, it can only be in play for one player at a time. If already in play, reroll.

1 V.P.:	Two couriers for two weeks. Roll 1D6 for result below:
1-2:	Two German *Merkur* class
3-4:	Two French *Lideau* class
5:	Two Azanian *Faidi* class
6:	Two French *Thorez* class
1 V.P.:	One fighter detachment (six fighters) including basing and supplies for indefinite defensive and patrolling duties in any system. Roll 1D10:
1-2:	*Riche* class
3:	*Wespe* class
4:	*Udet* class
5-6:	*Bonapart* class
7-8:	*Wellington* class
9-10:	*Donovan* class
1 V.P.:	One British *Exeter* squadron (four ships) for two weeks.
1 V.P.:	One *Guiana* (for French player) or one *Krupp 821*-class freighter (for German player) indefinitely. *French and German players only.*
2 V.P.:	Two full reloads of any missile set (French = 16 Ritage-1 and eight Ritage-2, German = 48 SR-10, American = 40 SIM-14 and four HD-5 Drones) to appear at any colony.
1 V.P.:	Recce couriers *Retief*, *Flandry*, *Falkenberg*, and one *Cargomax*-class freighter reconfigured to carry 14,432 tons of fuel plus spares, supplies, and maintenance personnel to support *Retief* class. Fuel sufficient for 16 *Retief* refuels. *American player only, one time only.*
1 V.P.:	Two Fs-17A fighters with crews and maintenance support ready for installation in *Kennedy* cargo bay. *American player only.*
1 V.P.:	American spare parts depot to allow repair rate increased from 12 points to 20 points per day placed at any one colony. *American player only.*
1 V.P.:	American crew replacement pool at any one colony. *American player only.*
1 V.P.:	Improve crew quality of any one vessel by one step.
4 V.P.:	A replacement cruiser of identical type for any cruiser lost in combat. Arrive with full crew complement and missile load-out at any colony where player admiral is present (if alive).

Each player starts with zero victory points and can begin earning them immediately. Victory points can go negative due to adverse events, but this can never occur due to overspending on the above chart. When victory points reach −5, the player character is relieved of command. His forces must return to the nearest colony where they will sit idle for five days until a replacement arrives. The force will then restart with victory points reverting to zero. If an admiral dies in combat, he will similarly be replaced in five days. If the flagship was also destroyed in the process, it will be replaced free of victory point cost, and the new admiral will have a default starting level of two victory points due to the epic and heroic death of the previous admiral.

As this is a role-playing rather than a strictly defined board game, situations may occur when the referee is obliged to make judgment calls on the awarding of victory points. He should attempt to be as fair as possible within the spirit of the above list.

Victory is assessed at the moment of destruction of the Kafer battleship. The player with the most points after the destruction points are awarded becomes the victor. He will get a one-grade increase in rank and a choice command assignment for his accomplishments.

ALTERNATIVES

The referee should feel free to explore various alternative flows for the campaign in order to keep the players from reading this article and knowing what to expect. Additional replays of the campaign will also need to be changed to add an extra surprise. The following suggestions are to help the referee add his own particular flavor to the game.

There may be more than one *Alpha* involved in the action. While only one of these will be the experimental battleship (see Discussion section below), a spare battleship may be available to allow the experienced crew to transfer aboard without awaiting damage repair. Various details in superficial markings or damage should allow the player characters to see whether this is or is not the battleship they have engaged earlier. If the Kafer crew switched back and forth, players may become convinced they are dealing with two Kafer intruders. Or there may be a separate *Alpha* which does conduct raiding operations at the same time as the experimental ship, but it is handled more clumsily according to normal Kafer habits. This support raider may alternatively be a *Beta* battle cruiser.

Kafer resupply also has several variations. Two or three Kafer freighters (use Manchurian *Shenyang* class from *Ships of the French Arm* as equivalent) may be crisscrossing space to rendezvous with the Lone Wolf at prearranged locations; they may be lying for long periods at All Stop waiting for the *Alpha* to arrive and give them instructions for the next rendezvous, or one might accompany the raider at all times to provide timely supply and repair. A particularly tricky play would be for these freighters to drop off supplies, missiles, and spare fighters in unpowered modules at prearranged sites. These caches could be anywhere and would be virtually undetectable to human forces except by strenuous active sensor sweeps which are unusual liabilities in wartime situations, especially if Kafer fighters are waiting to defend the caches. Conversely, if Kafer freighters lay low at All Stop, they could take the precaution of dropping a few low output power plants throughout the system as decoys for vessels making DSS sweeps. Active detection coverage by defensive fighters would be inadequate, as their range is too short to allow them to search the inaccessible areas where such caches would likely be dropped.

It is basically up to the referee if he wants to make full use of the third dimension in the system's tactical display in terms of search patterns and approaches to combat. While full use of the z-axis adds complexity to the game, for some playing groups, the extra flavor of space combat given by the third dimension is worth the effort. Either way, it is up to the referee and players, and the figures for two- and three-dimensional search capabilities are in the Detection Ranges for Human Starships table and the Detection Ranges for Human Fighters table.

For enhanced interaction, the referee can modify the rules

for reinforcements from newly violated colonies. Many of these colonies, particularly the British and Ukrainian, will have their own command structures and will not simply call up a ship or two to add to the other human forces. The referee could choose to add these forces under the control of a fourth player or else handle them in the guise of an NPC commander who would be seeing to his own uncooperative interests.

DISCUSSION

Human naval forces have almost gotten used to Kafer space tactics as being plodding, heavy-handed, and inflexible. Many battles have been decided because Kafer ships were simply sitting when battle was joined, still carrying unrepaired damage from previous battles. This inattention to detail has been much noted and discussed, not to mention appreciated. It had been virtually decided that the Kafers simply lacked the kind of mental agility to conduct creative military operations such as deep commerce raiding. That was until Hochbaden.

The Kafers also were aware that they often lost battles in the opening minutes before their crews could become aroused and efficient and while damage untouched from earlier engagements handicapped them still further. That, plus an unwillingness to break off when losing, functioned as something of a "force divider" in operations against humans. Several solutions had been considered by Kafer planners, and the Lone Wolf raider of the French Arm is one of the most interesting.

This *Improved Alpha* battleship represents an experiment in combat psychology and chemical stimulation designed to mitigate some of the limitations of Kafer short-term intelligence. Thus the crew, which has trained extensively under these modified circumstances, enters combat already aroused and primed to function effectively. By-products of this program are the safety features built into the *Alpha*'s control systems. The onboard computer analyzes damage patterns and rates and thereby calculates when an engagement has turned against the ship. If this happens, it automatically initiates disengagement maneuvers, generally retiring behind a heavy screen of X-ray missiles and *Golf* fighters. This feature allowed the experimental vessel to survive so that the lessons of its techniques could be assessed. The question is whether the Kafer will be able to reproduce the effectiveness of this prototype vessel on a large scale. The more successful its maiden campaign, the more determined the effort will be.

The players should find this combination of traditional Kafer physical staying power with more humanlike tactical flexibility quite challenging. No less important to them will be the questions of how to deal with each other.

All three players will likely want to build up "little" victory points at first, in order to finance various projects as soon as possible. The American player, handicapped by his distance from his logistics net, needs to rapidly set up his replacement, repair, and resupply systems by making the few quick, cheap sightings that his fast ships should allow him to get. The German player, with his slower, sensor-poor ships, will want a few quick victory points to attempt to buy some more forces for patrolling, while the French player would like to build up a cushion of victory points to allow him the option of issuing some orders at moments of prime opportunity.

While it would be easy to imagine the game degenerating into selfishness and backbiting, the three players really do have a serious interest in maintaining high levels of cooperation (at least in the beginning) to ensure that no one leaps ahead of the field. They should maintain a regular system of rendezvous and information sharing, for they need to know what the other players are up to, and they do not have enough forces to just shadow each other at the beginning of the game. While striking off on one's own will eventually be necessary, self-interest demands that the players do stick fairly closely together at first because if they're with you, you can see what they're up to.

Safety in numbers is also a good incentive, especially before there are enough victory points to make good any losses. The Germans and American cruisers make natural partners—the fast, sharp-eyed, thin-skinned *Kennedys* scouting for the plodding, armored, heavily-gunned *Hamburgs*. The Vice-Amiral, with his more balanced ships, can afford to go it alone if he needs to, but God forbid him to be absent from action that the Germans and Americans share. The interest of cooperative action must surely dictate that a French courier be present with all task forces, *n'est-ce pas?*

No matter who wins, the commanders of the three forces will each have that most coveted of naval commands: the independent cruiser force. Removed from the constricting demands of fleet operations, they still have the firepower to make their wills known. For some commanders, it just wouldn't be a decent war without a few Lone Wolves to hunt down.

—*David Nilsen*
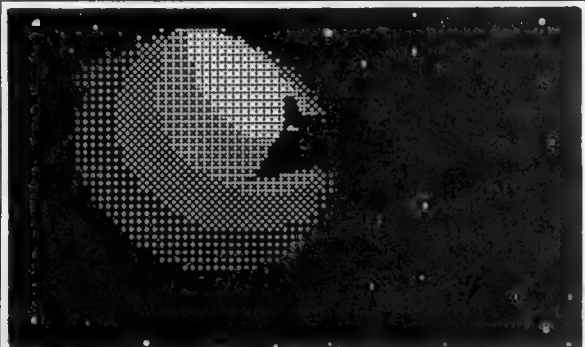
TABLE 1: DETECTION RANGES FOR HUMAN WARSHIPS

Area that can be searched in au^2 (2-D) or au^3 (3-D) per hour/per day

Class	Speed	By DSS/hr	Passive 2-D	Passive 3-D	Active 2-D	Active 3-D
Kennedy	2.4	7.94 au^2	.217/5.08*	.015/.35	.341/7.85*	.0362/.838
Suffren	1.68	6.50 au^2	.154/3.55*	.0106/.246	.213/4.85*	.0199/.457
Hamburg	.96	5.06 au^2	.065/1.48*	.0032/.0743	.0397/.923*	.00124/.029
Kiev	1.2	5.54 au^2	.0594/1.38*	.00223/0522	.122/2.77*	.00915/.209
Ypres	1.44	6.02 au^2	.083/1.94*	.0036/.085	.210/4.72*	.0222/.503
Sachsen	.72	4.58 au^2	.0238/.554*	.0006/.0139	.0559/1.25*	.00313/.0706
Aconit	.72	4.58 au^2	.364/.831*	.00136/.0313	.0559/1.25*	.00313/.0706
Retief	2.16	7.46 au^2	.196/4.57*	.0135/.316	—/—	—/—
Exeter	.96	5.06 au^2	.0479/1.11*	.0018/.0418	.0732/1.66*	.0041/.094
Emilon Gheni	.72	4.58 au^2	.0238/.554*	.0006/.0139	—/—	—/—

*"Flat" searches on an ecliptic plane can be conducted if the target is known to be within a certain distance of the ecliptic plane: Passive: .044 for Kennedy, Suffren, Retief; .032 for Hamburg; .028 for Ypres; .024 for Kiev and Aconit; .016 for Sachsen. Active: .068 for Kennedy and Ypres; .06 for Suffren; .048 for Kiev; .036 for Sachsen, Aconit, and Exeter; .02 for Hamburg. If this is not the case, a full 3-D search must be conducted using those figures. Speed is maximum linear in au per hour, DSS is in au^2 per hour, all others in au^2 for 2-D and au^3 for 3-D searched per hour/per 24-hour day. All figures in the table assume vessels moving at maximum speed in Star Cruiser rules (Kennedy corrected to 10 from the incorrect 9 listed in rules). The target size consideration for the passive figures is a signature 2 body, as in a Kafer freighter at All Stop. The active figures consider a signature 3 body, as a 1000 m^3 supply cache of $10 \times 10 \times 10$ meters of synthetic construction.

TABLE 2: DETECTION RANGES FOR HUMAN FIGHTERS

Class	Speed	Radius	Small Passive 2-D	Small Passive 3-D	Large Passive 2-D	Large Passive 3-D
Riche	1.68	12	.0825/.97*	.0031/.037	.154/1.78*	.0106/.123
Wespe	1.92	6	.175/1.02*	.012/.07	.259/1.49*	.0258/.149
Udet	1.68	12	.183/2.11*	.0149/.172	.258/2.92*	.0289/.33
Bonaparte	1.44	8	.0709/.555*	.00266/.0209	.133/1.02*	.00912/.0704
Wellington	1.44	7.5	.083/.607*	.0036/.0267	.146/1.04*	.0109/.0786
Donovan	1.44	7.5	.133/.957*	.00912/.066	.197/1.40*	.0196/.14
FS-17A	1.68	6	.0825/.486*	.0031/.0183	.154/.893*	.0106/.0617

*"Flat" searches on an ecliptic plane can be conducted if the target is within certain distance above or below ecliptic plane. Small: .052 au for Udet; .044 for Wespe and Donovan; .028 for Wellington; .024 for Riche, Bonaparte, and FS-17A. Large: .072 for Udet; .064 for Wespe and Donovan; .048 for Wellington; .044 for Riche, Bonaparte, and FS-17A. Speed is in linear au per hour, radius is combat radius in hours (half endurance out, half endurance back). The Small target is signature 2, including All Stop Kafer freighter, and the Large target is a signature 7 active Kafer Alpha-class battleship. Figures in au^2 for 2-D and au^3 for 3-D searched per hour/per 24-hour day. All figures assume vessels moving at maximum speed under Star Cruiser rules.

TABLE 3: USEFUL FIGURES AND CONVERSIONS

149.5 million km = 1 au
1 light-year = 63,240 au
Speed of light = .12 au per minute/8.3 minutes per au
A Star Cruiser hex = .004 au
Radius of various G Gradients from System Primary where R is in au and M in Solar Masses:

	.1G Gradient	$R = .07777\sqrt{M}$
	.01 G	$R = .24593\sqrt{M}$
	.001 G	$R = .7777\sqrt{M}$
	.0001 G	$R = 2.4593\sqrt{M}$

TABLE 4: STELLAR DISTANCES AND DEPARTURE ANGLES

Destination → / Departing From ↓	Beta Comae Berenices	Beta Canum Venaticorum	DM+27 28217	DM+35 2436	DM+36 2219	DM+36 2393	DM+46 1889	DM+48 2108	Eta Bootis	Henry's star	Hochbaden	Kimanjano	Queen Alice's Star	Vogelheim	Xi Ursae Majoris	61 Ursae Majoris
61 Ursae Majoris		337.46° × 28.38°D 6.40			74.05° × 41.32°D 4.80					208.74° × 15.79°D 2						
Xi Ursae Majoris										330.10° × 23.43°D 5						
Vogelheim				305.54° × 4.43°D 5.10		306.42° × 6.77°U 7.55										
Queen Alice's Star												78.07° × –0° 7.21				
Kimanjano	30.26° × 19.79°U 4.24	109.65° × 74.87°U 5.57						309.09° × 57.21°D 7.48		157.11° × 34.84°D 5.83			258.07° × –0° 7.21			
Hochbaden	200.32° × 14.60°U 5.92			172.30° × 51.54°D 5.92		214.29° × 57.63°D 4.69			48.18° × 58.13°U 2							
Henry's Star		352.87° × 27.52°D 4.47	104.25° × 24.78°U 7.07		93.30° × 22.90°D 5.57							337.11° × 34.84°U 5.83			150.10° × 23.43°U 5	28.74° × 15.79°U 2
Eta Bootis											228.18° × 58.13°D 2					
DM+48 2108				54.55° × 16.90°U 7.42									129.09° × 57.21°U 7.48			
DM+46 1889		153.84° × 20.70°U 6.63		89.05° × 28.07°U 6.78		68.68° × 40.05°U 5.51										
DM+36 2393	190.62° × 60.27°U 6.48	190.38° × 10.21°D 7.42		128.29° × 11.67°D 2.24			248.68° × 40.05°D 5.51	234.55° × 16.90°D 7.42			34.29° × 57.63°U 4.69				126.42° × 6.77°D 7.55	
DM+36 2219										273.30° × 22.90°U 5.57						254.05° × 41.32°U 4.80
DM+35 2436	235.78° × 64.01°U 6.78	208.89° × 6.89°D 6.56				308.29° × 11.67°U 2.24	269.05° × 28.07°D 6.78					352.30° × 51.54°U 5.92			125.54° × 4.43°U 5.10	
DM+27 28217										284.25° × 24.78°D 7.07						
Beta Canum Venaticorum				28.89° × 6.89°U 6.56		10.38° × 10.21°U 7.42	333.84° × 20.70°D 6.63			172.87° × 27.52°U 4.47		289.65° × 74.87°D 5.57				157.46 × 28.38°U 6.40
Beta Comae Berenices				55.78° × 64.01°D 6.78		10.62° × 60.27°D 6.48					20.32° × 14.60°D 5.92	210.26° × 19.79°D 4.24				

Note: First two figures (i.e. _____° × _____°D) are departure angles. U = up, D = down. Last figure is the distance between points in light-years.

Project Farstar

For thousands of years, it's been apparent that the range and capabilities of jump drives are the key factor influencing Imperial culture. The short-range jump drives used in the majority of Imperial merchant ships suit the government very well; they ensure that most ports will be visited occasionally since it's often difficult to bypass worlds that would otherwise represent poor markets. At the same time, slow communications make it difficult to mount a successful rebellion. Occasional civilian craft have J3 or J4 capabilities; in general these tend to be owned by wealthy individuals or organizations with a vested interest in maintaining the status quo, such as nobles and the largest megacorporations. Military craft need greater range and generally take a brute force approach to the problem; some sacrifice up to 90 percent of their design weight to drives and fuel.

Given the size of the Imperium, there's a clear need for faster communications; however, the government is anxious to ensure that they remain firmly under control. For example, the Xboat system is notable for the fact that all messages carried must be computer scanned for data storage and transmission, and it's probably safe to assume that Imperial intelligence agencies frequently analyze Xboat messages, especially those from suspect individuals or organizations.

Although the Imperial government sees no real need to improve civilian communications, there's a long-standing need for more efficient military designs and government couriers. At the same time, it's apparent that it would be almost impossible to build such ships without making the technology available to civilian scientists and contractors. There's also a problem in deciding how to allocate resources for the research since several approaches look promising but have yet to yield good results.

Farstar is the official project coordinating the research work. It's jointly funded by the Imperial government and services and by several megacorporations. Increased range for a given size of drive is given first priority, but other goals are decreased power consumption for a given mass, cheapness, and shorter jump durations. Other drive systems are also under investigation, but there has been little success in this area.
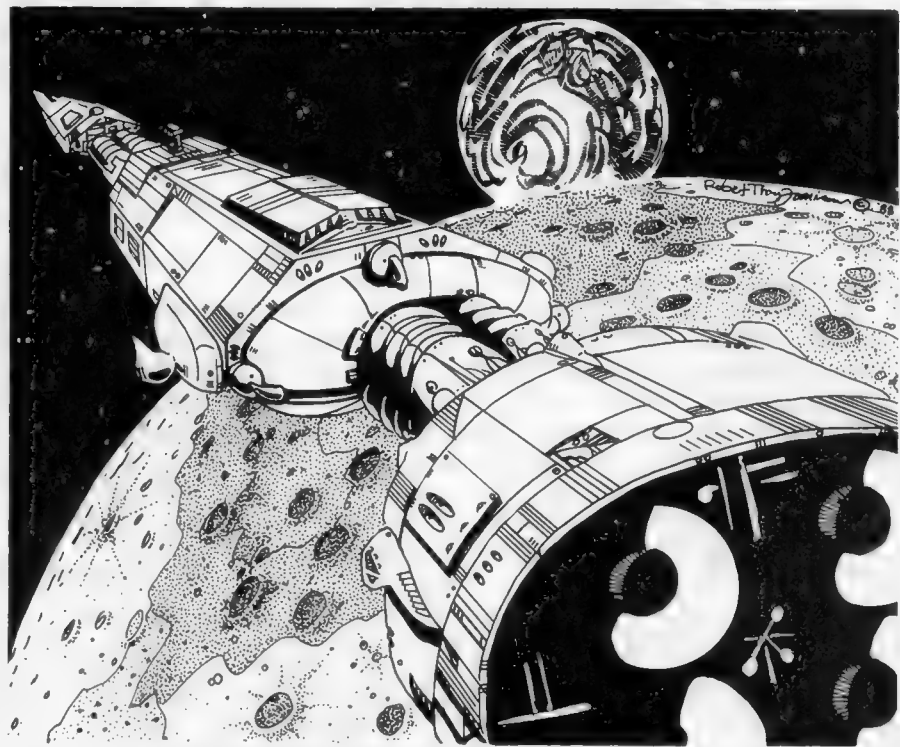
Some military design improvements have been achieved, but as yet there has been no development which would significantly improve civilian travel; it has occasionally been suggested that most of the interests behind the project would prefer to discourage widespread civilian use of this area of technology. If the government began to launch new classes of military ships, the megacorporations would almost certainly be prime contractors and could use similar drives in their own ships. Smaller companies wouldn't have access to the new drives and would gradually be frozen out by the megacorporations. The government has a cozy working relationship with the megacorporations and feels that they can be trusted with faster ships, but it would prefer to limit smaller lines and free traders to existing technology. In practice, this means keeping the megacorporations 10 or 20 years ahead of their smaller rivals.

Since there's intense public interest in this research, and since it's possible that workers outside the project might develop useful ideas, there's a prize fund for the invention or discovery of any new or improved method for interstellar travel. Rewards offered include grants, honors, and guaranteed royalties; however, participants must agree to hand over patent rights and all other forms of control.

Despite this limitation, there are several thousand applications for grants and hundreds of attempts to demonstrate "new" or "improved" drive systems every year. Most come to nothing, but there are occasional demonstrations of marginal improvements.

Most of the project centers are in sparsely populated systems within easy jump range of industrial and technologically advanced worlds. These systems are usually interdicted and are generally Amber or Red zones, since the TAS regards such installations as potentially extremely dangerous. In 878, a research station (and an area of several hundred thousand square kilometers around it) was destroyed in circumstances which suggested that the scientists involved had managed to open a temporary jump link or possibly a relativistic wormhole into the core of the local sun. In 1057 another installation apparently created a black hole, which subsequently "ate" the station and approximately 30 percent of an Earth-sized

planet. Both accidents have suggested new theories about the nature of space and time, but how they will be tested remains unclear.

While much of the work remains secret, four main approaches are apparently receiving the greatest attention:

1. Improvement of existing designs: This area has shown some results which blend into the overall technological advancement of the Imperium. In general, this aspect of the project makes slow progress rather than producing any spectacular breakthroughs.

2. Misjumps: It has long been known that component failures, fuel impurities, and gravitational effects can cause a ship to misjump, in some cases throwing a J1 ship as far as 36 parsecs. Several experimental ships of various designs have been fitted with deliberately faulty jump drives which will malfunction almost every time they are used, backup drives for the return journey, and enough fuel for a second jump if the ship materializes in an unpopulated area. Several ships have been lost on such missions; others have returned with data suggesting that the misjump effect is totally random and not amenable to any form of control.

3. Multi-drive systems: This is possibly the most promising area researched, but it is unsuccessful to date. Theory suggests that operating several jump drives simultaneously without merging their fields might generate a stress effect with the ultimate jump a product of the jump capability of each drive. Thus three J2 drives might multiply together to produce a J8 product, or three J3 drives for a J27 product. In practice, the effect seems to be that such drives either merge fields to give their average product, or oppose fields to give a greatly reduced effect. Occasionally they'll rip the ship apart.

4. Alternative drives: This area of research receives some attention, although most scientists doubt that anything useful will be produced. Various systems of matter transmission have been investigated, but all seem to be unusable at interstellar distances. In 984 this research produced a method of converting matter to tachyon state, but it was later realized that matter disintegrated into subatomic particles under the stresses involved. At present there seems to be no use for this system even in communications, since the information content of any tachyon transmission is always garbled: signals appear to be randomly distributed in time, so that even crude code transmissions (such as the ancient Terran Morse code) become unworkable.

The Scout service is continually alert for sightings and reports of ships which don't use normal jump drives, and Scout ships and bases have occasionally detected unusual phenomena which might be the result of such vessels' passage. However, it is equally likely that these observations were caused by purely natural phenomena or instrumental malfunctions.

Referee's Information

In order to preserve game balance, GDW suggests that referees should not allow the development of more powerful or faster jump drives. Although GDW has been known to break this rule, it may be best to assume that the normal **MegaTraveller** starship designs are the only types in common use. However, the search for enhanced drives can involve characters in unusual and potentially hazardous situations. The easiest way to avoid imbalance is to assume that all attempts

will fail, but a more interesting option is to allow the development of alternative drive systems which will have new and unforeseen problems. Not the least of these problems is the attitude of the Imperial government, which will do its best to ensure that civilians don't get their hands on faster ships.

The short scenarios below involve ideas for alternative drive systems, which shouldn't unbalance the game disastrously. All scenarios are in the style of **Traveller** supplement 6, 76 Patrons, and they are designed for three to six player characters.

(I) Patron: Imperial Government **Required Skills:** Space Crew **Required Equipment:** None

Players' Information

After years of research, Imperial scientists have developed a jump drive which can be set up to give either a "controlled" misjump of up to 36 parsecs in a random direction or a random jump of 1-36 parsecs in a controlled direction, which doesn't allow full control of direction and distance. Scientists have asked the services to supply volunteers to crew the ship on its maiden flight, and hope to gather enough data to allow simultaneous control of direction and distance.

Referee's Information

This adventure should be run as part of the extended character generation system in **Traveller** Books 4-7. Player characters in the services (including merchants, representatives of the megacorporations funding the project) should be assigned to the mission after 2D6 years of service while still in their chosen service branch, and the skills acquired during the mission should be related to their activities on the mission. See "Military Academy" in Challenge (the Journal of the Traveller's Aid Society) issue 26 for a background to adventures within the character generation process.

The ship is a modified Far Trader carrying its normal J2 unit, a J1 unit which will initiate the controlled misjump, and a model 4 computer. The cargo capability is devoted to additional fuel capacity (for a J2 jump if the ship emerges in interstellar space), instrumentation, and supplies for a prolonged flight. The designers have not realized that the deliberate misjumps impose tremendous subatomic strains on all working parts, making the normal (and supposedly perfect) J2 unit prone to random misjumps. This effect will give a cumulative + 1 DM on the misjump roll for the J2 unit, increasing with each deliberate misjump. No normal method of correcting the fault (such as flushing the fuel supply) will reverse this effect; the only remedy is a new drive. On a roll of 12 + , the special J1 unit will malfunction and give a truly random misjump with both distance and direction selected completely randomly. Fortunately the area selected for the tests has a large number of solar systems; the GM should choose a suitable area, remembering that one or two misjumps could take a ship out of the sector.

Roll 1D6

1-3: Scientists will discover the distortion effect after two to four experimental jumps and order a return to base using the J2 unit. Allow skills to influence the chance of misjump during the return flight, but say what the modified chance will be.

4: Two NPC scientists are Solomani or Zhodani infiltrators (substitute spies or terrorists most relevant to your campaign)

who will try to hijack the ship after the first jump.

5-6: The theory behind the project is faulty, and the J1 unit will cause totally random misjumps from its first use.

If any of these possible outcomes or the random nature of the drive under testing leaves the ship in interstellar space with insufficient fuel to reach any system, see Appendix A below. If you would like to use this situation as a way of sending characters on a prolonged trek through unexplored space, see **Traveller** *Adventure 4, Leviathan.*

(II) Patron: Noble **Required Skills:** Ships crew **Required Equipment:** None

Players' Information

Sir Mazun Kir is an eccentric Vilani aristocrat and dilletante scientist encountered at the TAS hotel in port. He claims to have invented a new form of jump drive and is recruiting a crew to fly his ship (a modified subsidized merchant) eight parsecs to the nearest Imperial research station, which happens to specialize in such projects. He is not prepared to discuss the new drive and will operate it himself.

Referee's Information

The ship's engineering compartment has been gutted, and an oversized power plant has replaced the normal drives and jump system; heavily armored superconductor cables lead through armored bulkheads to the main hold, and the other holds contain extra fuel tankage. The computer is of an odd design seemingly assembled from parts of several nominally incompatible machines; most of its processing power is hardwired for jump control, with no other capabilities. Needless to say, the holds are firmly sealed, and access requires a combination, explosives, or cutting gear and several hours work. Khir should be played as a true eccentric—rhapsodizing about the beauty of space one moment, then cold and a little paranoid a few seconds later. Players who attempt to look him up in the local equivalent of "Who's Who" will learn that he owns companies holding patents on several jump drive components. Patent files show that these are all minor refinements on existing technology rather than true technological advances.

If team members gain access to the hold, they will find that it contains three military surplus J2 units surrounded by a network of odd circuitry and components. Unless characters can spend several hours examining the unit, it will make little sense. If this time is available, they will realize that it is an attempt to link these three drives so as to multiply their effects. The three J2 units would thus theoretically become a J8 drive.

Roll 1D6

1: "Khir" is perpetrating an elaborate confidence trick. He's spent years building up his cover as a noble but is actually a criminal mastermind. There have been months of publicity surrounding the project, and the research base knows when the ship is supposed to arrive. As the ship heads out to the jump point, it will be intercepted by a privateer. Khir won't try to fight (and the ship isn't armed anyway); the team will be taken aboard the privateer and held prisoner. A week later, an identical ship will arrive at the research station with badly damaged engines, and Khir's twin brother will start to negotiate contracts. Their network of companies will raise 100 million credits from share sales and Imperial contracts before the fraud is

discovered. Naturally the teams are then a weakness in the plan; as soon as Khir is sure his fraud has begun to work he'll have them killed, unless they can escape first.

2: Khir thinks that he has made a breakthrough but is wrong. The arrangement he has devised will result in a merging of fields, giving a normal J2 jump. The ship will emerge in interstellar space, a parsec from the nearest habitable system. Fortunately there's enough fuel for one jump, provided the players can persuade Khir to cooperate in gutting his system and running one of the three drives as a normal J2 unit. Khir will gradually decide one of the teams is responsible for the failure and denounce them as saboteurs when they reach port.

3: The same as 2, but the jump fields are opposed so as to give a small jump equivalent to J0.5; also, there will be no fuel left, apart from the maneuvering reserve. This leaves the ship stranded in interstellar space, but it will be just inside maneuver range of port. The team can survive if they can convert one or more compartments into emergency low berths and take watches over the two or three years needed to return to the port. If they don't use low berths, they'll run out of food and oxygen months before reaching port.

If no one thinks of this, or the teams are unable to complete the work, see Appendix A below.

4: At the moment that Khir switches on his drive system, the three engines will simultaneously explode outwards, boring neat holes through the supporting apparatus and the walls of the hold. On a roll of 11+ the hold hatches will give way under the sudden explosive decompression, leaving the entire ship in a vacuum. The ship won't travel anywhere and won't be fit for normal jump travel until the hull is repaired. The ship is heavily mortgaged to pay for the experimental drives, and the cost of repairing it will leave Khir bankrupt and unable to pay the team.

5: Khir has made a real breakthrough, and his system of drives will operate perfectly. They will also melt into radioactive slag a few seconds after the ship returns to normal space. Khir will be offered a contract to develop a more usable version of the drive for the Navy. If the teams have no criminal records, they may be offered work on one or the other of the experimental vessels at the station. Otherwise they will be hustled onto the first available flight out of the system. If the teams have done anything to arouse Khir's suspicions, such as searching the hold, he will suggest that base security hold them until they can be interrogated by Imperial Intelligence agents. Subsequent events are left to the referee's discretion.

6: The same as 5, but the drives will not melt.

(III) Patron: Spy **Required Skills:** Computer, Combat skills **Required Equipment:** Ship

Referee's Information

The spy is working for a local shipping line which doesn't want to be kept out of the latest areas of technology. The nearest research station is two parsecs away, an asteroid in an uninhabited system. The referee will need to design an installation built as a hollowed asteroid with surface structures and docking spaces for six ships. Four ships are at the station when the team arrives, with marking indicating experimental designs. The referee should maneuver the team into attempting a raid on the offices and computers of the station, or attempting to steal a ship by specifying enough guards and weapons'

installations to make a total takeover or multiple theft impossible.

If the players decide to raid the laboratories, they will gain access to plans and models of 1-3 of the vessels described below. If they decide to steal a ship, describe the external appearance of all four vessels and let the players make a choice:

1: A modified trader similar to that described in encounter (I) above. Use the rolls for malfunctions described above if the teams decide to try the experimental drive.

2: A laboratory ship with the multiple jump drive system described in (II) above. Use the same malfunction possibilities if the teams attempt to operate the experimental drives.

3: An unusual design, a 100-ton spherical hull with no maneuver drives. It contains an experimental J2 drive, which should allow direct jump initiation from a planetary surface without the normal risk of a misjump or destruction. In fact the experimental circuits are incomplete, and any attempt to use the drive will destroy the ship and its occupants. Characters with Engineering-2 or better should be able to complete the installation in 6 + 2D6 hours. Once complete it will allow direct jumps from a planetary surface without risk of destruction but with a guaranteed misjump.

4: A Type S Scout/Courier, with a number of external pods, booms, and antennae. This ship looks like it might be carrying some new type of drive; in fact, it's assigned to frontier patrol duties, carrying sensors and recorders. On its last flight, it detected a burst of Cherenkov radiation which seemed to imply the passage of a tachyonic starship. It has been sent to the station for analysis of the recorded data and sensor checks.

Roll D6

1-2: The Scout's instruments are faulty.

3-5: The ship actually detected a burst of tachyonic particles transmitted by the research station.

6: The Scout detected an alien spacecraft using a genuine tachyonic drive. It is now over 50 parsecs away, heading for a cluster 500 parsecs beyond the Imperial borders.

The spy will be prepared to pay the full price for the ships described in 1-3 above or 1.0 MCr for the Scout and the data it contains. On a roll of 8 +, the money will be forged (at forgery level 3); on a roll of 9 + the spy is a Solomani agent, whose cover is work for the shipping line.

Appendix A: Rescue from certain death in the vacuum of space (Deus ex Machina Department).

Several of the devices and situations described may leave travellers aboard vessels marooned in interstellar space. The following is suggested to give a chance of rescue or escape.

a) Each player rolls a percentile dice three times without being told why. The referee records all rolls.

b) If any player rolls 42 on any throw or rolls three numbers adding to 42, the ship will suddenly be rescued by a passing starship (at a fairly high improbability factor).

c) If the numbers rolled by all the players add up to a number exactly divisible by 42, the same thing will happen.

d) If none of the players make any of these rolls, roll on the following table for an event occurring 1D6 weeks after the misjump:

1: Pirates find the ship.

2: A comet nucleus is detected at extreme maneuver range (bearing enough frozen gas to refuel the ship).

3: A fleet of hostile warships finds the ship. They are about to launch a surprise attack and will do their best to ensure that no one gives any warning.

4: The ship encounters a space-going life form (for example, an intelligent dust cloud of the type described by Sir Fred Hoyle in "The Black Cloud." If the team can establish friendly contact (this should be very difficult), it will help them by accelerating the team's ship to 99 percent of the speed of light, giving them a short (subjective) flight home but actually taking years or decades of objective time.

The teams arrive home to discover that they've long been given up for dead and must spend several months unravelling the mess and resuming their lives and careers.

5: The ship encounters some form of space warp, wormhole, or black hole, giving a chance for a very risky random
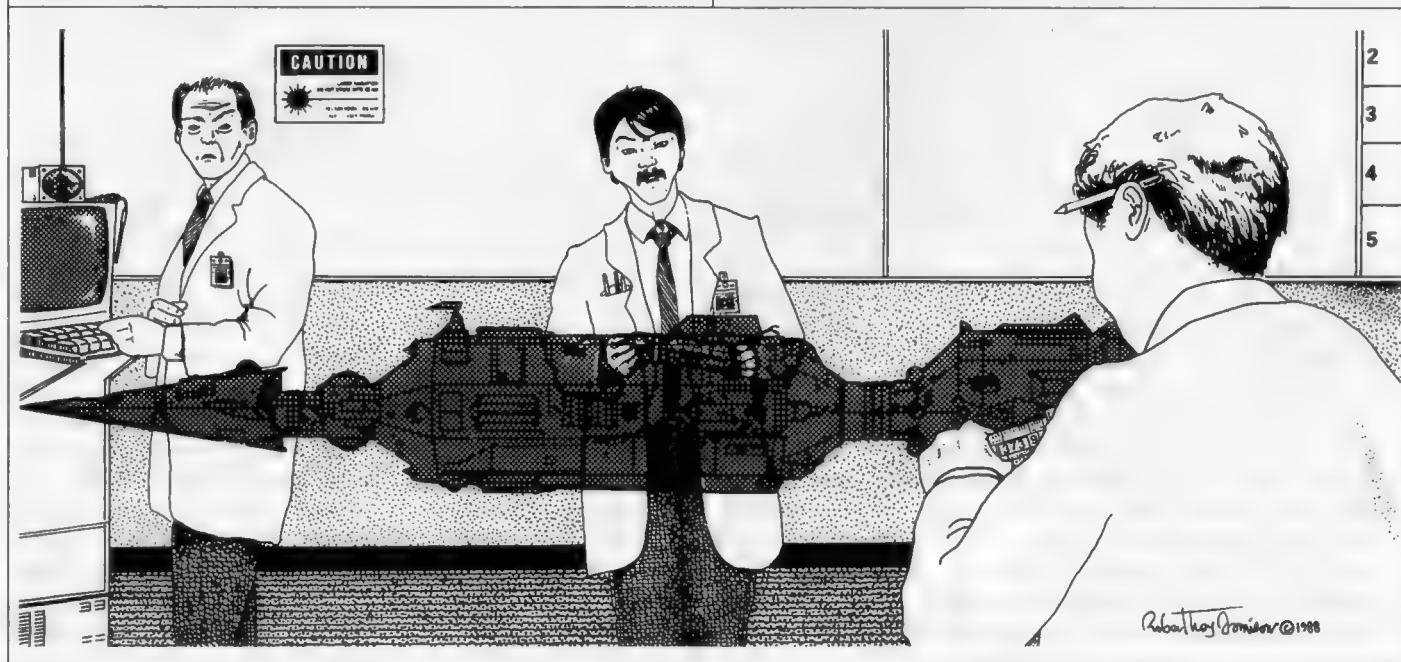
jump outside normal space-time. If the teams make enough engineering and scientific skill rolls, they'll reach a system where they can refuel and make repairs.

6: (Only use this ending if your players have good senses of humor and are at least partially responsible for their present predicament):

There's a knock on the outer door of the airlock. When someone opens it the teams will discover that the ship is in a hanger, apparently on an Earthlike world. The man (?) standing outside welcomes the team to the afterlife and explains that their lingering deaths have been edited out of their memories to avoid unnecessary distress. Now it's time for the team to be reincarnated again. Would they like to begin by rolling a few dice to determine the shape of their future careers...?

Appendix B: Further Information

Greatly enhanced jump drive systems are described in the GDW **Traveller** adventure *Secret of the Ancients,* and in the GDW **Traveller** adventure *The Traveller Adventure.* Descriptions of several useful interstellar drives can be found in the following publications: *The Hitchhiker's Guide to the Galaxy* by Douglas Adams, *The Avatar* by Poul Anderson, *Let The Spaceman Beware* by Poul Anderson, *The Deep Reaches of Space* by A. Bertram Chandler, *The Dark Dimensions* by A. Bertram Chandler, *Catch the Star Winds* by A. Bertram Chandler, *The Forever War* by Joe Haldeman, *Bill the Galactic Hero* by Harry Harrison, *Palace of Eternity* by Bob Shaw, *Ship of Strangers* by Bob Shaw, and *Who Goes Here* by Bob Shaw.
　　　　　　　　　　　　　　　　　　　—*By Marcus Rowland*

WIN FAME AND FREE DICE

Readers of this magazine have a chance to win a GAMESCIENCE 100-Sided Die, FREE! Gamescience plans to publish a "Book of Tables" to be released at Origins/GenCon®. This magazine is assisting Gamescience in its quest for new, interesting, amusing and informative tables. We will send a Gamescience D100 ZOCCHIHEDRON™ die free to the authors of the top three tables submitted. The winning authors will have their names listed alongside their tables, and winning authors will also receive three free copies of the book after it is published. (Do not send in tables for the heights, weights or lengths of humans, nonhumans, animals, creatures, monsters, idols, deities or artifacts.) Tables may be any length, and may require the use of a 4-, 6-, 8-, 10-, 12-, 20+, True 20-, 30-, or 100-sided die, as well as the use of an even-numbered shape which does not yet exist, such as a 48 or 60.

Rules: All entries must be mailed on or before July 4, 1988. All entries become the property of Gamescience, and none will be returned. Each entry should list first whether the table is designed for Fantasy, History, or Science Fiction. Tables will be judged for humor, originality, merit and utility. All submissions must be original work. Rearranging the sequence in which items are listed from a table which is already in print is not considered original work. Each submission must list the name, address, and home phone number, as well as work phone number, of the author. The author of each listing published by Gamescience will receive three complementary copies of the book as well as an acknowledgement of the author next to his listing.

Each entry must be accompanied by a signed, dated and witnessed letter which states: "I, _____, do hereby certify that I am over 21 years old and the author of the _____ table which is being submitted with this letter. I agree that Gamescience will be held blameless in the event of a dispute arising from the publication of this table. I understand and agree to the conditions of submission and publication." (If author is under 21, the letter must be countersigned by parent or legal guardian who certifies that they are aware of the conditions and concur with the agreement proposed.) This magazine will also be held blameless in the event of any disputes arising from the publication of these original tables.

North America, 2300

Where North America, specifically the United States, was at one time the focus of world domination and power, the changing political climate of the last 300 years has repositioned the area's importance. Where it once enjoyed the stature of a superpower, North America is now simply in the mainstream of many industrial nations. The days of the superpowers ended with the nuclear exchange, so now both nations and individuals sleep easier in a world of competitive industrial countries.

Of course, the geography of the area and deep-seated political allegiances still give North America a competitive edge over many other areas of the planet. The Western Hemisphere, once the exclusive swimming pool of the United States, is no longer a safe haven for only one industrial nation—South America has emerged as a powerful region, finally coming into its own in the world community. But the traditional partnership between Canada and America lives on, and the two nations enjoy domination of at least the northern half of the hemisphere.

THE NATIONS OF NORTH AMERICA
America
United States of America
Demographics

Population: 211,540,000 *Urban:* 85% *Rural:* 15% **Literacy:** 100% **College Educa-**tion:** 89% **Life Expectancy:** 92.1 male, 94.5 female **Largest Cities:** Chicago (2,340,000), New York (2,255,000), San Francisco (2,087,000)

Economics

Industrial Capacity: 17 Rudell Units **Agricultural Output:** 107%, net exporter of grain **Mineral Production:** 77%, net importer of metals and radioactives, principally from off-world **Power Production:** 112%, net exporter of power (mostly to L4 and Mars) *Solar:* 80% *Atomic:* 12% *Mineral:* 8% **Principal Trading Partners:** Canada, Nigeria, Great Britain, France

Transportation

Surface Transportation: A nationwide airfilm network provides steady passenger and freight service between virtually all cities, supplemented by both intercity air and tunnel service. Personal transportation is confined to an out-of-date highway system and to modern air corridor regulation.

Interface Transportation: Much of America's interface freight needs are served by contract to Libreville-Gateway. There are numerous slingshots, most notably near Denver, Boulder, and Wheeling, to serve other freight needs. For passenger service, virtually all cities have regular space plane flights. Shuttle systems are in operation in both Miami and Honolulu for passenger/freight operations.

History: After obtaining independence from Great Britain in the late 18th century, America struggled as a new colonial power to both guard itself and dominate the other nations of the hemisphere. Eighty years into its history, however, America was already torn over issues of slavery and states' rights and forced into bloody civil war—a conflict which nearly shattered the young nation. During the latter half of the 19th century and all of the 20th, America was in complete control of affairs in the Western Hemisphere and a dominant force in world events. America projected its will and military might in many conflicts, including all three world wars.

America's superpower status was ended by the Third World War. The nation was plunged into another civil war in the midst of famine and desolation. During this time America lost both Texas and the Southwest. Chaos reigned for 20 years before some semblance of federal authority was reestablished. Extensive public work programs were instituted to rebuild the nation and its confidence, so that by the end of the century America had settled into its new role as an equal among competitive industrial nations under the umbrella of the French Peace.

America became embroiled in war with Mexico over Texan independence (2099-2103) and then in supporting the

Californians against Mexico in a civil war (2103-2106). Mexican and American rivalry has lived on from these troubled times to the present.

America's own space program began in earnest in the mid-22nd century, in close cooperation with Australia. Its fair industrial power combined with its superb advanced education did much to allow America to dominate an entire arm of human exploration and, eventually, colonization. A colony was established at Mu Herculis in 2215 and on Ellis in 2229. America has traditionally had a large presence in space, both in the Sol system with L4 and Mars outposts, and in interstellar space.

America has spent most of the 23rd century consolidating its continental nation and its off-world assets. Ellis was made a state of the Union on July 4, 2276, the quinticentennial of the United States.

24th Century America: Americans traditional notions of America as the greatest nation on Earth and America as defenders of democracy in the world ended in the nuclear exchange and ensuing famine of the 21st century. A new direction of national effort and will dedicated itself toward the rebuilding of the nation from scratch. The everyday struggle to survive put notions of world domination out of the American mindset. A surge of nationalism and isolationism swept the country, easing the pain of a people taking a step backward in world ranking.

In 2300, America is a strong industrial and technological nation which provides a comfortable living for its terrestrial population. The trend in population movement has been from rural to urban, but the overall size of cities has come sharply down, mainly for two reasons. First, the paranoia of postwar America hit home for some time as people avoided radiation areas even after they were safe to revisit or settle. Second, the speed of transportation has made commuting even 200 or more kilometers to work and back quite common.

The typical American household is quite comfortable, most homes being computer moderated at all times. Government-sponsored entertainment, ranging from video broadcasts to theater and musical touring companies, keep the citizenry entertained. In America, cities measure themselves very often by both their sporting teams and their entertainment facilities. Most cities have complete arenas or concert halls as a central element of their individual character.

Technology has allowed the American work force to be significantly reduced. A person can expect to begin a career after a lengthy specialized education, perhaps at age 28. Retirement is common around the age of 50, at which time social services will at least support a family at a fair level. Most families have a single income.

Off-world migration is greatly encouraged by the government. Special monetary incentives are offered to families or individuals who will permanently emigrate to one of the American colony worlds. Overall, response has been good, and many hundreds of families emigrate every month, but the government is running into the problem of how to convince comfortable people to leave for a less comfortable life elsewhere.

Canada
Demographics

Population: 28,243,000 *Urban:* 76%, *Rural:* 24% **Literacy:** 100%

College Education: 98%, **Life Expectancy:** 93.0 male, 97.6 female, **Largest Cities:** Toronto (2,850,000), Montreal (2,760,000), Vancouver (2,367,000)

Economics

Industrial Capacity: 2 Rudell Units **Agricultural Output:** 106%, net exporter of grain **Mineral Production:** 104%, net exporter of metals and radioactives **Power Production:** 80%, net importer of power *Solar:* 50% *Atomic:* 45% *Mineral:* 5% **Principal Trading Partners:** America, Great Britain, France, Japan

Transportation

Surface Transportation: An extensive road network and standard rail net crisscross the country, reaching up into the rich oil fields of the Northwest Territories. Airfilm lines have been established between Montreal and Toronto and between Toronto and Ottawa. Individual aircraft and all-terrain vehicles are commonplace in remote Canada.

Interface Transportation: Toronto and Ottawa have space plane service to orbit. Edmonton has the nation's catapult monopoly, and Vancouver is the launch site of the Canadian national shuttle system, established in 2249.

History: A close ally of America through the 20th century, Canada avoided much of the destruction of the Third World War and capitalized on its survival through the 21st century. It built up its own industrial base while America faltered, and then established itself for a time as the leader of North America, at least until America managed to get back on its feet around 2100.

A national effort began in the 22nd century to make Canada the higher education center of the world. A tremendous effort was put into motion at that time to attract great thinkers to Canada to teach, to build facilities which would draw students from around the world, and to build a worldwide reputation for superb education and positive results. Canada correctly recognized the economic potential in being a leader

GOLDEN GATE HISTORIC SITE

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in education. Other nations eventually began sending students, as a matter of national policy, to Canada, not wanting to be left behind in the thinking of the age. By the end of the century, Canada had achieved its goal and remains the uncontested master of higher education on Earth.

Canada's Northwest Territories yielded a tremendous find of petrochemicals in the 22nd century, turning the area into something of a boomtown. Cities were erected, and wells and pipelines built. However, as the worldwide need for oil products declined over the next century, the area has cut back production drastically, and the entire deserted area remains something of an embarrassment to the Canadian people.

A latecomer to the interstellar space race, Canada didn't even launch its first stutterwarp-capable ship until 2290. It established an outpost on DM + 19 5116 and DM + 15 4733 and established its first colony world, Doris, in the DM + 20 5046 system in 2273. That area of space has, in fact, become known as the Canadian Finger. The colonization of Doris is a national imperative, according to the government. With the help of the frontier spirit which still lives on in western Canada, the migration effort to Doris has been quite successful.

The Canadians have also established an enclave on the Sung homeworld.

24th Century Canada: As the champions of advanced education and so-called liberal thinking, the Canadians have obtained for themselves a unique and interesting national character. Canadians, for the most part, view themselves and their state as the main proponents of world peace and ecological safety. Canada is one of the greatest supporters of the North American Research League, of which members and administrators have close ties to the universities and government of Canada.

Canada's level of actual employment is rather high for the industrial nations of Earth, with remarkably few people on public welfare. The timber industry is the chief employer in the West, oil drilling and refining in the North (though this has dwindled greatly from its heyday), agriculture in the Midlands, and education and government in the populous southern portions of Quebec and Ontario. So much of the population is productive, in fact, that standard measures of Canada's economic health belie its strength.

Doris is a center of pride for the Canadian people. Presently, its population is very small and is based on families transferred on the company level to new industrial branches being started there. The government hopes to encourage another wave of settlers to arrive at Doris in the next couple of years. Tremendous incentives are offered to families which emigrate and to companies which encourage employees to transfer to Doris.

Texas
Demographics

Population: 12,655,000 *Urban:* 78% *Rural:* 22% **Literacy:** 99% **College Education:** 77% **Life Expectancy:** 89.7 male, 93.4 female **Largest Cities:** Houston (2,350,000), Dallas (2,077,000), Galveston (1,850,000)

Economics

Industrial Capacity: 1 Rudell Unit **Agricultural Output:** 95%, net importer of grain, net exporter of animal products **Mineral Production:** 100%, net exporter of oil **Power Production:** 70%,

net importer of power *Solar:* 0% *Atomic:* 40% *Mineral:* 60% **Principal Trading Partners:** America, Brazil, Ukraine

Transportation

Surface Transportation: A heavy road network, built in the early 23rd century, links all major cities. Personal aircraft are uncommon, though many types of all-terrain vehicles are common in the arid western regions of the country.

Interface Transportation: Both Houston and Dallas have state-owned space plane service to orbit, but both are also stopovers for American and Chinese space plane services. Texas has no state-owned heavy lift capacity, using either facilities in America or at Libreville-Gateway.

History: Texas was wrested from America by Mexico in 1999, a time when America itself was involved in tremendous civil disorder. With America unable to hold onto the Southwest, Mexico annexed the areas and retained them, making them new Hispanic territories during the 21st century. However, in 2099, Texas rebelled against this rule, fighting for and winning its independence from Mexico, while at the same time avoiding political and economic domination by America. Texas won its independence in 2099, making it a separate nation for the first time since 1845.

Political strife and social pressures put a heavy strain on the new nation of Texas from its conception. Hispanic factions rallied to attempt to bring Texas back into the Mexican fold, occupying and terrorizing much of western Texas for decades. Oil men saw advantages in becoming an American state again and put political pressure on the new government. But even with these pressures, no one faction could get into power a pro-Mexican or pro-American government, so Texas has remained independent to the present day.

A brief military coup was attempted by pro-Mexican radicals in 2230. Three hoverborne regiments seized access into and out of Austin, the capital, in an attempt to flush out and replace the government. In great Texan tradition, however, the populace took up arms and effectively eliminated the rebellion's army units before loyal troops could arrive. The Civilian Defense of Austin is celebrated every March 23 throughout Texas, an event which reinforces the individual's right to bear arms.

24th Century Texas: The Texas of 2300 is in many ways the same as it was in the days when it was an American state. The oil economy plays havoc with the whole country's economy, taking finances on a continuous roller coaster of good times and bad. The Eastern Seaboard is still fair agricultural land, and the West is still home to some traditional cattle ranches. However, these ranches are being put out of business by larger operations using automated herding techniques and long-term "harvesting" approaches to animal handling. The seaport of Galveston has become something of a boomtown—the gateway to trade with the rest of the world, exporting oil and beef and importing necessities from South America and Africa.

Due to heavy influence from the Hispanic portion of the population and the many years of Mexican rule, Texan architecture has shifted from traditional Western skylines to flat, low to the ground buildings geared to take advantage of as much solar energy as possible. Most homes are of a mock adobe style, always at least passively solar, reducing necessary energy production on the national level. The energy figures given above

do not reflect this abundant energy resource.

Texas' reach for the stars has been something of a lackluster effort on the part of previous governments to keep pace with other industrial powers. However, the country's own economy cannot really support a grand effort in space, and many Texans view continued expansion in space as a terrible long-term mistake. Present-day elections are very often won or lost over the issue of further expansion off-planet.

Mexico
Demographics

Population: 124,347,000 *Urban:* 68% *Rural:* 32% **Literacy:** 96% **College Education:** 68% **Life Expectancy:** 89.5 male, 93.3 female **Largest Cities:** Mexico City (5,344,000), Los Angeles (3,430,000), San Salvador (2,754,000)

Economics

Industrial Capacity: 12 Rudell Units **Agricultural Output:** 78%, net importer of grain and animal products **Mineral Production:** 76%, net importer of metals, net exporter of oil **Power Production:** 100% *Solar:* 78% *Atomic:* 0% *Mineral:* 22% **Principal Trading Partners:** Argentina, Venezuela, Azania

Transportation

Surface Transportation: Mexico suffers from an inadequate internal transportation net. The road system exists but is in serious need of repairs. Standard railroad service between major cities exists, but the overall reliability of Mexican railways is substandard.

Interface Transportation: Mexico City has interface space plane service, but only as stopover flights from America and Japan. Mexico's only state-owned interface capabilities are under military jurisdiction, located in Yucatan.

History: Mexico's poor economic health of the 20th century was not significantly altered by the Third World War, and the nation suddenly found itself in fairly good shape among the devastated countries around it. Most importantly, its northern neighbor, America, was particularly off its feet, and Mexico took advantage, moving in on Texas in 1999 and the rest of the Southwest in 2025. These new areas added greatly to Mexico's wealth and helped to solidify the army's place in establishing foreign policy.

In 2099, Texas rebelled against Mexican rule and managed to break free. American support to the Texans is reputed to have turned the tide in their favor. However, the Texas rebellion coincided with an important power play against Guatemala in the south, which kept much of Mexico's armed forces away.

The Mexican governments of the 22nd century are characterized by wily military leaders controlling foreign policy in a blatant campaign to topple Central American nations. The technique used time and time again is to appeal to the Hispanic roots of the populace in a nation, support unrest there, and then move in with the military to overthrow the government. The isolationist policies of America at the time prevented its intervention, so Mexico was free to do as it pleased in Central America. Cases in point are the dates on which the Central American nations fell to Mexico; Guatemala in 2103, Belize in 2105, Honduras in 2117, El Salvador in 2123, Nicaragua in 2140, Costa Rica in 2145, Cuba in 2148, and Panama in 2161. Only in the cases of Nicaragua and Panama were military clashes necessary for Mexican domination. Each toppled country, in turn, has gained statehood in the United Mexican States.

The military rule of Mexico coincided with a military expansionist period in Argentina's history. The two nations together planned to dominate Central and South America, and to assert themselves as viable industrial nations in the 22nd century and beyond. Their first test came with the Alpha Centauri War (2162), which eventually led to the Melbourne Accords, vital to the expansion of both Mexico and Argentina.

Mexico's off-world possessions include a colony on Kwantung, where the newer Mexican colonists are sharing both their culture and world with the older Manchurian settlers, and a very successful colony on Montana, in cooperation with their traditional Argentinian allies. Both worlds are along what has become known as the Latin Finger.

24th-Century Mexico: Mexico's national identity is characterized by the military. National service is required for two years of all citizens, many of whom can expect to serve off-world in marine units or with Mexico's space navy. The military presence is so pervasive that Mexico is the opposite of Canada in regard to peace—the Mexican viewpoint is that the military is a tool toward an end, no matter what that end might be.

Another element molding Mexico's national character is the thrusting of many different Hispanic groups and cultures together. The intermixing of cultures and ideas has been surprisingly tolerated and encouraged by the various administrations. The results of this intermixing of cultures have been better overall education and an easing of the political strife which would be expected among fallen states. For instance, Salvadorans are not only allowed to keep their national heritage and customs, but are also encouraged to share them with the general Mexican population. The government hopes this will build harmony among its people, and thus far the plan is working.

Unfortunately, the cost of a military society has cut deeply into the economy. Mexicans do not enjoy many of the advantages of 24th century living. Indeed, many still live in abject poverty in the slums around Mexico City and Los Angeles. Economic reform is in order, and many groups are involved in pressing for those changes. However, revolution is something which is pretty much out of the question. Even those who are poverty-stricken are very much in love with their country, and families can remember days which were not nearly as good as the present. Mexico has made a steady climb out of the so-called Third World, and the population appreciates and supports it.

Note on Rudell Units: Jurgen Rudell (2120-2189) was an economist who was born in Hanover and renowned for his work with industrial capacity and forecasting. His chief contribution to future generations was the creation of the Rudell unit, a measuring system designed to measure one nation's industrial output against another's in order to calculate balances of trade. Though the applications Rudell intended are universally considered out of date today, the Rudell unit is still common parlance among economists and governments. In short, one Rudell unit represents 1,000,000 well-educated individuals directly involved in the hands on manufacture of industrial goods, including machinery, public works, and general construction.

—Timothy B. Brown

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The following errata have been noted in the *Small Arms Guide*:

In several locations the *Type* notation and the *Ammunition* notation are in conflict. In all cases, the latter is correct.

Page 4: The damage rating for the Auto-Mag 44 should be 2, not 1.

Page 20: The damage rating for the Colt CAR-15 is 2, not 1.

Page 41: The comments on the capacity and type of magazines available for the Atchisson/Dae Woo Assault 12 shotgun are confused. There are two types available: a seven-shot box and a 20-shot drum magazine.

Page 42: Delete the word "semi-automatic" from the entries for the Mossberg M590 and 500.

Page 43: The illustrations of the Remington Model 1100 and the Savage Model 69-RKL are transposed.

Page 49: The correct ammunition type for the KPV machinegun is 14.5mm Bloc, not 14.7mm Bloc as indicated.

Page 53: Two data lines are given for the M1 Garand. Delete the second one.

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you are in a room with three trolls and a treasure chest. It is another to be able to see the situation, with a heroic fighter figure facing three horrible looking trolls guarding a glittering treasure chest of jewels and gold.

Of course, I may be tainted by my gaming past. Before I had even heard of such a creature as a role-playing game, I was an avid miniatures gamer. I had painted and played with hundreds and hundreds of Napoleonic, Civil War, and Ancients miniatures, fighting battles and campaigns on an elaborate gaming table we had erected in my parents' basement. I was very familiar with the concept of miniatures, how to get them, how to paint them, etc.

Also, as anyone who paints miniatures armies knows, a hundred figures can be a mere drop in the bucket, lost in the ranks of dozens of units on a very large battlefield. But for a fantasy army, a hundred figures is a gihugic (ji-huj-ik) quantity, enough to give you a tremendous variety of adventurers and nasty monsters for them to run into.

So, given this background, I figured role-playing games and miniatures were a natural partnership. Besides, instead of having to paint forty identical guys for a Napoleonics unit, every fantasy miniature demanded some more attention, individual detail, and creativity not warranted elsewhere. Getting fantasy miniatures was fun, plain and simple.

My early days of gaming were also the days when a set of rules weren't expected to cover every aspect of play. House rules were commonplace—indeed, our games couldn't be played without them. Some of that tradition has carried on into present day designs under the guise of giving greater latitude to the referee (yeah, right). Specifically, there were no miniatures rules to speak of (who ever had *Chainmail*, anyway), so we made up our own.

It's a fairly simple task to motorize the combat rules of a role-playing game for miniatures use. Mostly you need some method of regularizing movement and initiative, both easily conjured up by a clever group of players. It wasn't until role playing's second generation games that serious efforts were undertaken to get these kinds of rules into the original game.

So what is the point of this editorial? Well, should there be complete miniatures rules in a role-playing game or not? Obviously, I'm pulling for the affirmative. Provided the rules are fast-moving and easy to learn, I would want to use them. Let's look at the advantages and disadvantages of using miniatures in a role-playing game, starting with the negative.

First, there is a certain amount of expense incurred. Fantasy or science-fiction miniatures are not especially cheap, but again, you don't need all that many. Of course, you will have to buy paints and brushes. If you're breaking into miniatures, you will spend a few dollars. After that, picking up new figures is a nickel-and-dime operation you can take at your own pace.

Second, you will have to learn to paint your figures. It takes time to learn to do a fantastic job with your miniatures, but you'll be able to do an adequate job almost from the onset. Patience for painting may also become a problem. You will need to set aside some time just for painting. I know in my case, this is nice and relaxing, but not everyone agrees.

Third is the question of terrain. From my standpoint, terrain can be as big an undertaking as you want. I've seen fine miniatures battles played with virtually no terrain, using dice to represent various features. I've also seen the other extreme—a complete tavern/inn/bawdyhouse set up, detailed down to the beds, tables, and paintings on the walls, for use with musketeer brawling games. You can be as clever as you want. To some extent, your background in miniatures will help determine your level of interest in working to create elaborate terrain.

Now, there are several advantages to having miniatures in your role-playing games. First among them, in my mind, is looks. Nicely painted figures depicting the characters in action really make a smashing scene. They can help hold my interest in what might otherwise become an exercise strictly in imagination. Imagination is nice, indeed necessary, don't get me wrong, but it is very nice to have something substantial to look at or touch.

Of course, a second advantage to using miniatures is their concrete existence. How many times have you argued with the referee: "I thought I was over there," "No, I distinctly remember you saying you were over here." With miniatures, these questions are much less common. I have problems visualizing a complicated encounter using only my head or a hastily created map on paper. Figures give me something to see, to deal with, something on which to base my decisions that I can count on as being accurate.

Convinced? I hope so. Miniatures are an entire branch of our hobby which shouldn't be ignored. There are dozens of miniatures manufacturers out there, all of them making fantastic figures for all types of periods. Their quality has never been better (anyone remember the quality of figures just 10 years ago? What progress!). Whether they are necessary to complete enjoyment of a role-playing game is a question you'll have to ask yourself. As for the guy on this soap box, I wouldn't run a game without them!

—Timothy B. Brown

Davout

SYSTEM DATA

Orbit (au)	Core	Diam (km)	Density	Mass	Gravity	Mol. Wt. Ret.
1: 0.40	Rocky	14,000	1.3	1.70	1.256	4 (massive)
2: 0.80	Icy	2000	0.6	.002	0.121	299 (vacuum)
3: 1.04	Rocky	5000	1.2	.071	0.431	38 (standard)
4: 1.66	Icy	11,000	0.1	.063	0.273	94 (very thin)
5: 3.16	Icy	4000	0.1	.003	0.099	299 (vacuum)
6: 4.43	Icy	6000	0.3	.030	0.258	105 (very thin)

Pressure	World Type	Water	Oxygen	Temperature
1: 1227	Gas giant	1% crystals	None	None
2: 118	Ice ball	50% ice	None	Cold-vcold
3: 421	Failed core	40% sheets	None	Cold-vcold
4: 267	Ice ball	40% ice	None	Cold-vcold
5: 96	Ice ball	50% ice	None	Vcold
6: 252	Ice ball	20% ice	None	Vcold

FIRST OUTPOST

As France began its colonization efforts in the late 22nd century, French policy was undecided as to which direction through space French efforts should go. Initial outposts were formed on Bessieres and Augereau as French explorers moved toward Beta Canum Venaticorum. Shakeups in the organization of French exploration efforts resulted in the formation of an outpost at Serurier in 2159. Without an established area available to develop and expand, French explorers travelled extensively along what are now the three main arms.

The formation of an outpost at DM – 26 12026 in 2175 was the event that turned France irrevocably toward its present arm. Manchuria had formed an outpost at DM – 26 12026 in 2172, and Argentina completed one there shortly after France arrived. French politicians were used to having their interstellar positions unchallenged, but when the Argentinian and Manchurian outposts boycotted French products, citing unfair trade practices, the French outpost was caught out on a limb. For lack of generated revenues, the outpost almost shut down.

Then, in 2179, the French minister of space activities, Pierre Davout, came up with a solution to the problem. In order to prevent further occurrences of this nature, Davout said that France needed to make itself economically indispensable to other nations' colonies and outposts. As an example, he noted the almost complete lack of a refueling station in the d'Artagnon area of the arm, which was heavily travelled by survey vessels of many nations.

Davout's plan was simple. An outpost would be placed on an icy planet in the DM – 44 11909 system. Ice miners would extract ice from the ground. It would be lifted into orbit by an interface vehicle and processed into fuel in orbit. Then the outpost could reap the profits.

Davout's decision to place the outpost on a planet startled many observers. His first choice was to place an orbital mining station near either the system's Oort Cloud or the rings of DM – 44 11909 I (Vieuxmonde), DM – 44 11909's gas midget. Neither option was available, however; DM – 44 11909's Oort Cloud was virtually nonexistent, and Vieuxmonde's ring system was composed primarily of rock.

Davout picked the fourth planet for the outpost's location. Although the gravity there was slightly higher than the gravities of some other suitable worlds in the system, Davout felt that a near-normal gravity would simplify matters for the outpost personnel. A site near the equator was selected for the outpost.

Another controversial decision was Davout's idea that all mining operations at the outpost take place underground. Although mining through rock to access the ice would be time-consuming, Davout said that miners from Earth with little experience in spacesuit operation could operate more efficiently in a pressurized mine.

So simple was the plan, in fact, that it was implemented almost immediately. An orbital terminal was in place by 2182, and construction of the outpost was completed in late 2183. As the French planners were selecting a name for the outpost, Davout was tragically killed in an accident. In honor of its creator, the new outpost's government selected the name "Davout" for the outpost, planet, and system.

The outpost provided inexpensive fuel to survey vessels and, later, to colonizer vessels which passed through the system. The outpost at d'Artagnon provided an equally valuable port-of-call for supply replenishment. By 2200, however, France had decided that its path lay on the French Arm and suspended further development on what later became the Chinese Arm.

SECOND OUTPOST

In 2208, however, the situation changed. The Japanese announced their intention to form a colony on Beta Hydri. The effort was to be in one massive push, and logistics would be strained to the limit. A deal for fuel and supplies had been cut with America, but France, for its own reasons, would not sell Davout fuel to Japan for discounted rates. Japan was in a quandary.

A wild card appeared, however. Hikaru Shungen, chairman of the Shungen Mercantiles Group, offered to construct a Japanese fueling base on Davout if provided with government funding. The government agreed, and by 2210, Shungen had constructed an ice mining outpost, another orbital terminal, and a catapult to launch ice into orbit.

Shungen's business nearly strangled the French outpost. Just as it seemed the French were going to shut down, disaster struck. A cave-in at the Shungen mine killed more than 300 miners and wrecked the mine facilities. The situation was ironic; the French mine was still open, but the Japanese still had the catapult. Both outposts faced financial ruin. In a hastily prepared agreement, the French and Japanese decided to pool their resources. The French would ship ice to the Japanese, who would fire it into orbit. Profits generated would be shared by the outposts. The two outposts began a

symbiotic relationship.

Shungen has since evolved into a scientific outpost for the study of Davout, a red M5 V dwarf. Massive arrays of radio and optical telescopes have been placed almost 30 kilometers northwest of Shungen. The telescopes are manned by relays of Japanese and French astronomers.

The full linkup of the two outposts was realized in 2262, with the completion of the maglev line between Shungen and Vile de Glace. Profits rose enough that both outposts are virtually economically independent of their mother countries. Interface transport is available from both outposts to the orbital terminal (the Japanese one; the French terminal was scrapped in 2248).

DAVOUT (VILLE DE GLACE)

The following is an excerpt from *"All You Need to Know About Davout,"* printed by Kirota Press of Shungen (2295).

Having been acquainted with the history of Davout, the reader should appreciate the difficulty which accompanies life on the Frontier, expecially on an airless world like Davout. Colonial construction is typically heavy since the worlds of the Frontier are demanding on equipment and personnel. Every attempt is made to smooth out the rough edges and make life more comfortable for colonists. Ville de Glace typifies this concept.

The outpost is completely subterranean. It consists of five levels and a mine complex. Each level has its own personality and function.

Level One: Level One is the outpost's housing level. Spacious but compact dwellings for families are spread out over the outer periphery of this level; barracks for ice miners make up the inner part of the level. While this arrangement has caused problems in the past, it *has* prevented a daily stampede of miners through the residential areas. The level is split into three sublevels for maximum use of space; different sublevels may be accessed through use of the central shaft elevators or strategically placed ladders which may be found near the edges of the level.

Level Two: This level houses the outpost's hospital and administration. The hospital is a newly refurbished, 50-bed medical center which has all the latest medical equipment. The staff members are professionally trained to deal with any emergency that might crop up. The administration area houses the outpost's governor and administration, providing both offices and housing for the outpost's government. A squad of French Colonial Militia lives near the central shaft, partly to protect the governor and partly to keep the miners in check. Firearms, incidentally, are forbidden in Ville de Glace.

Level Three: The third level is the recreational level. Many shops and restaurants may be found here, but the main attraction is the holoceiling. Massive holographic generators create an artificial skyscape so realistic that one can hardly tell the difference between the ceiling and the real thing. A number of tennis courts are here also. The few bars which exist here are heavily policed, and there are few fights between miners.

Level Four: Level Four houses the business district and public schools. Most private ventures in Ville de Glace are run from here, including a private mining venture called Duchamps et Grisemont. Duchamps leases one of the outpost's mine shafts and ships ice on the Japanese catapult. The other businesses include several banks and investment agencies. The public

school teaches youngsters from age four to age 18. A staff of several teachers runs the school year-round, since there isn't a summer to enjoy.

Level Five: The fifth level is the largest in the outpost. The outpost's massive storage facilities are located here. The storage areas contain enough food to sustain the outpost for six months, an unassembled hydroponics farm, and all types of electronic and mechanical equipment. The maglev station has loading equipment for loading the 40-ton (metric) ice blocks which are brought up from below into the train's storage cars. A number of spare passenger cars and spacesuits are kept in the station in the event of a disaster which forces evacuation.

The mine area is a stark contrast to the warm, brightly lit levels above. Lights and anticollision beacons are placed only in heavily travelled areas. The entire mine is pressurized, but heating is not provided, since the ice would melt. The miners wear distinctively colored environment suits which protect them from the cold. The central chamber serves as a marshalling point for ice brought up from the mines. The mine shafts extend outward for approximately two kilometers before descending. Ice and miners both use modified hovercraft to move from the central chamber out to the shafts.

The outpost receives its power from a 20-megawatt fission reactor which sits directly above the outpost. The reactor is topped by a communications center which relays communications to the orbiting communications satellites. Traveling topside is discouraged by the natives.

SHUNGEN

The principal outpost on Davout is the Japanese catapult station, Shungen. Constructed by the Shungen Mercantiles Group between 2209 and 2211, the station is state-of-the-art. The outpost design is based closely on that of the American outpost at Clarkesstar.

The outpost is half subterranean and half surfaced. The surfaced section is composed of the three domes which are the main feature of the outpost. The subterranean section is made up of four separate levels.

Dome One: Dome One is the main dome of the outpost, 200 meters across and with a radius of 150 meters. The dome is made up of reinforced concrete with sandwiched layers of kevmylar. Automated self-sealing units crawl over the opaque surfaces of the dome repairing the occasional meteor impact. The upper third of the dome is transparent plexiglass, which admits sunlight. Massive kliegflour lights ring the edge of the window, providing the equivalent of Terran daylight to the inside of the dome. The areas around the central shaft are planted with grass and some small trees and are a favorite among the outpost's citizens.

Dome Two: The second dome is the maglev dome. The interoutpost maglev line ends here. A loading dock with cranes moves the massive ice blocks to ATVs from the maglev cars, and a pressurized ready room is provided for the dock workers. This dome is not pressurized.

Dome Three: This is the catapult dome. Work areas are provided for the preparation of ice for the catapult. Although the dome is pressurized, it is not heated (it is, in fact, refrigerated during the local afternoon) since heating would melt the ice.

Level One: Level One includes the outpost's administration and business district. The Shungen Mercantiles Group

representative has his offices here, as does the station's governor. The two men are on an equal level, but the SMG rep decides on major station actions, while the governor is responsible for upholding and creating station laws. The business district includes the SMG corporate offices and several banks.

Level Two: The second level is the housing level. Housing is more spacious than at Ville de Glace but is similar in function. Decor is modeled after the traditional Japanese style. Synthetic floors are overlaid in wood; rice paper walls are used in many residences; and Japanese art may be found everywhere, including in the miners' living areas. Deskmounted computers may be found in most residences.

Level Three: Level Three is the outpost's medical and recreational level. The medical facilities are advanced and include 60 beds and the latest in American automeds. The staff is trained by SMG and is competent in its duties. The recreational areas include fencing boxes, martial arts arenas, and racquetball courts with holographic audiences.

Level Four: Level Four houses the outpost's shopping district and storage areas. The shopping district contains a wide variety of stores and restaurants, including a critically acclaimed French restaurant. The storage areas contain enough essential material to keep the outpost running for six months. Almost any type of necessary goods may be found here, including a functioning but unused hydroponic tank, computers, limited numbers and types of firearms, and even some Pentapod equipment.

Reactor Facility: Below Level Four lies the outpost's reactor facility. A 50-megawatt MHD Turbine supplies power for the outpost, the catapult, and the maglev line. A modern airscrubbing plant keeps the outpost's air fresh, while a small electrolytic unit liberates oxygen gas from small ice deposits located under the outpost.

Mine Remains: Underneath the reactor lie the remains of the mine. On Feb. 8, 2212, SMG miners prepared to blast a particularly large ice chunk into manageable pieces. Unfortunately, a detailed geological study of the site was never made; if it had been, the miners would have known that the ice they were mining was the keystone for the entire site. They detonated their charges, and what followed was perhaps the most horrific mining accident in history.

The entire structure of ice above collapsed when its support was removed. The immediate area around the outpost subsided 15 meters, crushing the miners. Then the whole mass fell another 10 meters, completely filling in the lower level. A total of 292 miners lost their lives in this horrible accident. Many outpost facilities were damaged, but only minor injuries were inflicted on the people in the outpost. An extensive survey conducted by Japanese geologists revealed that the site was still unstable. All mining was to be banned immediately.

IMPORTANT NON-PLAYER CHARACTERS ON DAVOUT

The following lists important non-player characters.

Governor Hideki Tokugawa

Tokugawa is the Japanese governor on Davut. He is responsible for law enforcement in Shungen and ensuring that relations with the French at Ville de Grace remain cordial. Tokugawa graduated with honors from the University of Kyoto in 2268 and held several staff positions before being placed in charge of the Davout outpost. He is very competent and despises incompetency. He and the SMG executive, Yasunari Hiroshige, are constantly at each other's throats.

Tokugawa is 55 years old, stands 184 centimeters in height, and weighs 65 kilograms. His build is thin but muscular, and his face is hard-set but friendly. He does not stand on his position but walks freely among his constituents without the protection of a bodyguard. By the way, he is very skilled with the katana (ancient Japanese warrior's sword) and will use it if necessary. He has a Melee skill of seven.

NPC Motivation Results: Heart 8 (strong commitment to his constituents), Heart Jack (Tokugawa is known for his wisdom, acquired over his many jobs).
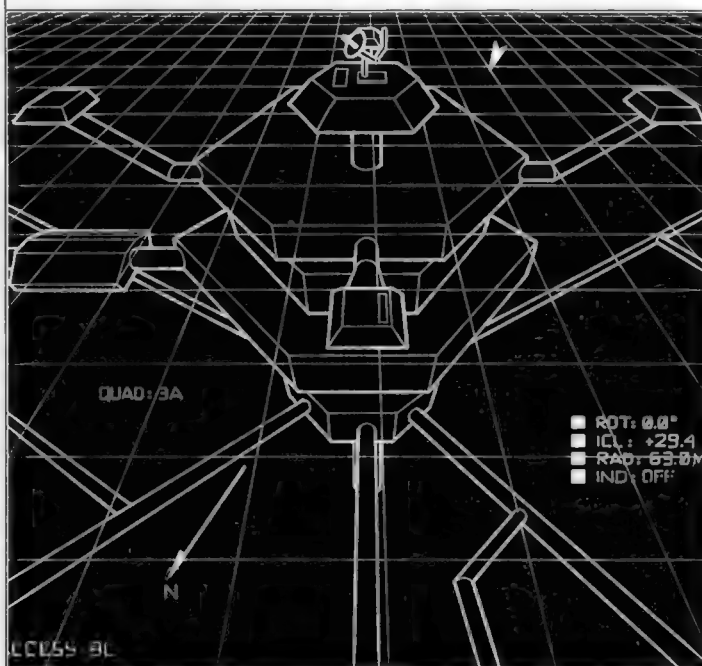
Administrator Yasunari Hiroshige

Hiroshige is the Shungen Mercantiles Group executive on Davout. He is responsible for the smooth operation of the outpost's catapult and maglev line. The only reason that everything *does* run smoothly is that Hiroshige has an excellent staff which keeps him out of trouble. Hiroshige, or "Yas" as the catapult personnel call him, hasn't the slightest idea about how to run a multibillion-yen outpost. Seemingly unaware that the outpost was running at optimum efficiency before he arrived, Yas decided to impress the company officials by speeding up ice production. The net result was a reduction in safety at the catapult site. When an ice block slipped out of its launch cradle and crushed a particularly vital piece of equipment, which forced the shutdown of the catapult for a month, Yas managed to hush up the whole affair. His other mistakes, foulups, and gaffes are too numerous to mention.
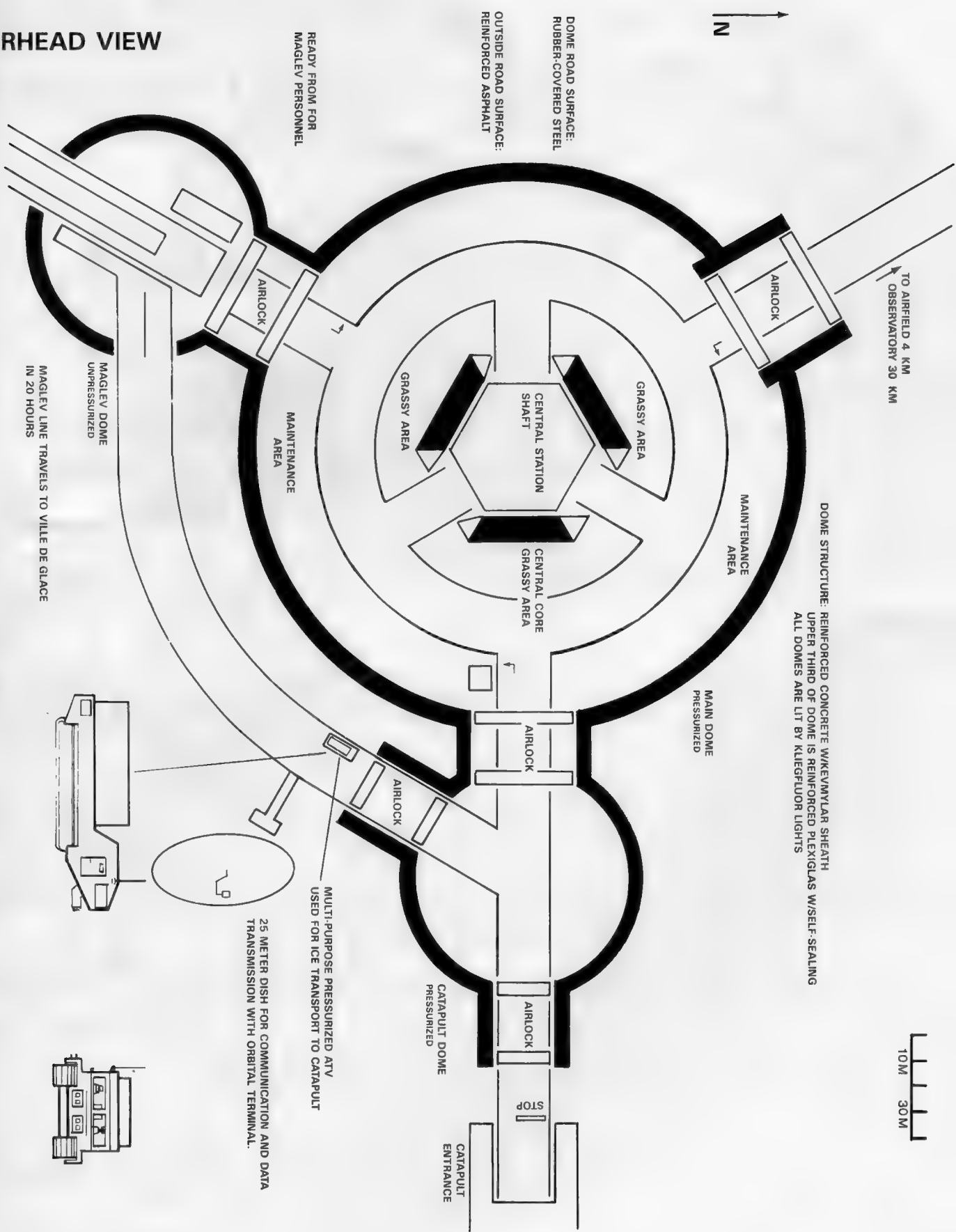
Hiroshige is 47 years old, stands 191 centimeters in height, and weighs 112 kilograms. He has a large (almost obese) build and a plain face with a large mustache. He is never seen without his bodyguard, Jomtp, a large, muscular ape of a man. Hiroshige has a Bureaucracy skill of five.

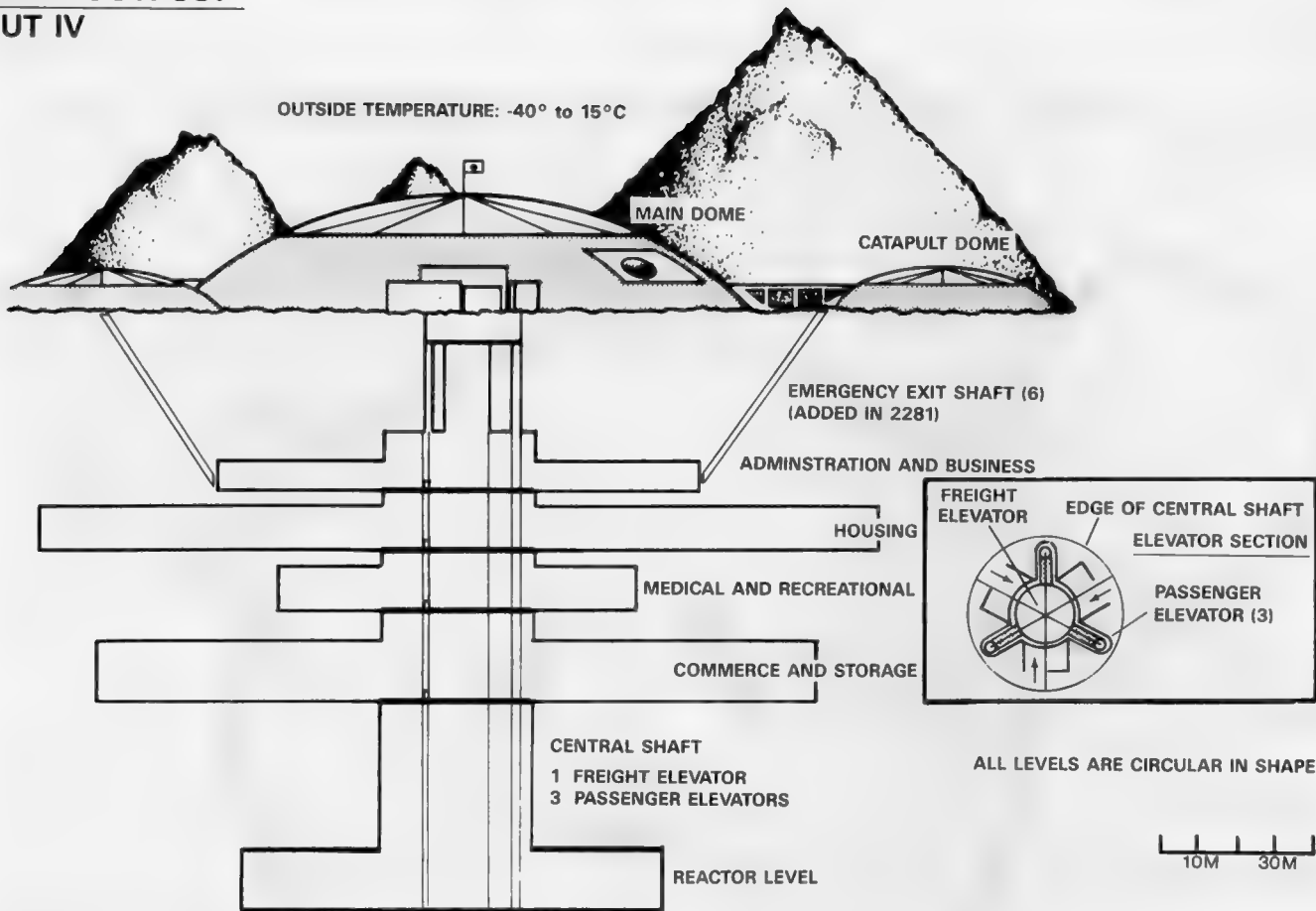**NPC Motivation Results:** Club Queen (very stubborn!), Spade 7 (social climber).
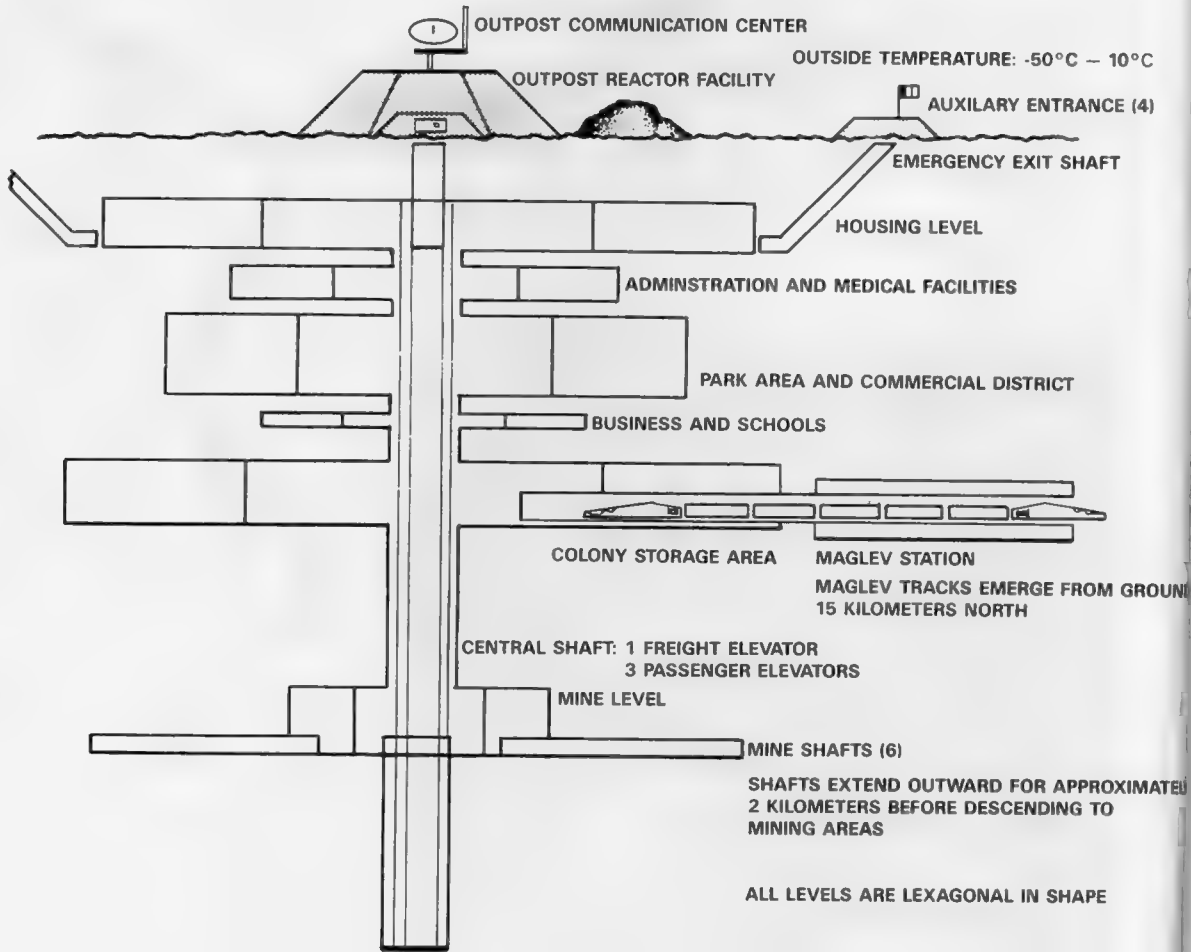
—*Clay Johanson*

QUAD: 3A

ROT: 0.0°
ICL: +29.4
RAD: 63.0M
IND: OFF

CCLSS 9L

JAPANESE OUTPOST
DAVOUT IV

OVERHEAD VIEW

N

DOME ROAD SURFACE:
RUBBER-COVERED STEEL

OUTSIDE ROAD SURFACE:
REINFORCED ASPHALT

READY FROM FOR
MAGLEV PERSONNEL

MAGLEV DOME
UNPRESSURIZED

MAGLEV LINE TRAVELS TO VILLE DE GLACE
IN 20 HOURS

AIRLOCK

MAINTENANCE
AREA

GRASSY AREA

CENTRAL STATION
SHAFT

CENTRAL CORE
GRASSY AREA

GRASSY AREA

MAINTENANCE
AREA

AIRLOCK

TO AIRFIELD 4 KM
OBSERVATORY 30 KM

DOME STRUCTURE: REINFORCED CONCRETE W/KEV/MYLAR SHEATH
UPPER THIRD OF DOME IS REINFORCED PLEXIGLAS W/SELF-SEALING
ALL DOMES ARE LIT BY KLIEGFLUOR LIGHTS

MAIN DOME
PRESSURIZED

AIRLOCK

AIRLOCK

MULTI-PURPOSE PRESSURIZED ATV
USED FOR ICE TRANSPORT TO CATAPULT

25 METER DISH FOR COMMUNICATION AND DATA
TRANSMISSION WITH ORBITAL TERMINAL.

CATAPULT DOME
PRESSURIZED

AIRLOCK

STOP

CATAPULT
ENTRANCE

10M

30M

JAPANESE OUTPOST
DAVOUT IV

OUTSIDE TEMPERATURE: -40° to 15°C

MAIN DOME

CATAPULT DOME

EMERGENCY EXIT SHAFT (6)
(ADDED IN 2281)

ADMINSTRATION AND BUSINESS

HOUSING

MEDICAL AND RECREATIONAL

COMMERCE AND STORAGE

FREIGHT
ELEVATOR

EDGE OF CENTRAL SHAFT

ELEVATOR SECTION

PASSENGER
ELEVATOR (3)

CENTRAL SHAFT

1 FREIGHT ELEVATOR
3 PASSENGER ELEVATORS

ALL LEVELS ARE CIRCULAR IN SHAPE

REACTOR LEVEL

10M   30M

FRENCH OUTPOST
DAVOUT IV

OUTPOST COMMUNICATION CENTER

OUTSIDE TEMPERATURE: -50°C — 10°C

OUTPOST REACTOR FACILITY

AUXILARY ENTRANCE (4)

EMERGENCY EXIT SHAFT

HOUSING LEVEL

ADMINSTRATION AND MEDICAL FACILITIES

PARK AREA AND COMMERCIAL DISTRICT

BUSINESS AND SCHOOLS

COLONY STORAGE AREA   MAGLEV STATION

MAGLEV TRACKS EMERGE FROM GROUND
15 KILOMETERS NORTH

CENTRAL SHAFT: 1 FREIGHT ELEVATOR
3 PASSENGER ELEVATORS

MINE LEVEL

MINE SHAFTS (6)

SHAFTS EXTEND OUTWARD FOR APPROXIMATELY
2 KILOMETERS BEFORE DESCENDING TO
MINING AREAS

ALL LEVELS ARE LEXAGONAL IN SHAPE

SPACEGAMER
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IS BACK

Space Gamer / Fantasy Gamer magazine is returning well in time for Christmas, and with so much to herald, we want to make sure you get the right gift! Space Gamer magazine has been published for eleven years, and has served Science-Fiction and Fantasy gaming fans faithfully through the years. It is a magazine with a long history, an outstanding reputation, and now it's having a glorious rebirth.

The new Space Gamer / Fantasy Gamer magazine will be appearing in stores and mailboxes throughout the land by December. Issue number 77 will mark a new era of creativity for one of the longest-published magazines in the hobby.

The new Editor is Anne Jaffe, formerly of Game News magazine. Anne is not only one of the industry's most qualified (and esteemed) editors, she is also energetic, organized, devoted, punctual, and has a great eye for the details that make all of the difference in a quality magazine product.

The new Art Director is Vince DeNardo, currently Art Director for both Fire & Movement and Computer Gaming World magazines. Vince is giving Space Gamer / Fantasy Gamer a new look, dynamically improved over previous issues, and an advance for all magazines of this genre.

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Stutterwarp Revisited

It is undeniable that the development of stutterwarp technology has had one of the greatest effects upon humanity in the history of the race. Suddenly, a culture that had been effectively bound to one star system found itself able to travel easily among the stars. This is not to say that there are now no limitations to where humans can travel, however. The limited availability of tantalum, the material necessary for the working of stutterwarp drives, and the limited distance that a stutterwarp engine can travel before requiring discharge both serve to keep routes of travel within certain boundaries. Perhaps in the future, humans will be able to simply point a ship in any direction and quickly travel any distance to reach their destination. But for now, we must work within the boundaries set upon us by our present understanding of physics...

From Dr. D. Bartholomew Wenthworth's opening comments to his Introductory Physics students, Chandler University, Hermes, the American Arm.

AN OVERVIEW

Most people are by now familiar with the basic concepts of stutterwarp operation. For those readers, this article will be of interest in explaining why there is a 7.7 light-year limit on the distance that can be travelled before a discharge is required, and what the effects are on ship and crew if that distance is not made. The article also reveals a couple of new developments on the American Arm that are allowing the 7.7 limit to be circumvented somewhat. As well, definitions are made of exactly where a stutterwarp can be discharged. Finally, a discussion is included concerning the use of sensors in detecting vessels in space, particularly stutterwarp vessels.

But for those people who are new to the concept of the stutterwarp drive, the following short description is provided.

THE BASICS

Stutterwarp drives operate on the same principle as the tunneling phenomenon in certain atomic particles. In essence, they allow a mass to be moved from one location in space to another location in space without travelling through the intervening area. The move is instantaneous. This jump is known as the Jerome Effect, after Dr. Emile Francois Jerome, who first demonstrated it with a hydrogen bomb.

The distance that an object can be moved is relatively short in comparison to stellar distances—each jump is only several hundred meters—but the cycling time is very rapid, on the order of hundreds of thousands of times per second. Because of the nature of the jump, the cycling time is fixed, but the amount of charge buildup can vary, allowing distances jumped to be adjusted according to the travel speed desired. Greater masses require larger charges to jump the same distance as smaller masses, and more powerful engines are able to build these charges more rapidly. Therefore, a smaller stutterwarp ship will travel faster than a large ship with the same engine (its lower mass means that each individual jump is longer), and ships with more powerful engines travel faster than ships of the same size with weaker engines (the higher charge means longer individual jumps).

All of this may seem like common sense, but common sense is a dangerous thing to trust when discussing the stutterwarp phenomenon. As an example, objects travelling by stutterwarp seem to have a velocity, but it is purely illusory. There is no feeling of thrust as there is with the use of drives such as those in rockets. If the stutterwarp drive is stopped, the vessel it propels also stops—immediately, completely, without any sense of deceleration. In fact, since stutterwarp movement is only pseudo-velocity, any velocity the vessel has when the stutterwarp is engaged (such as orbital velocity) is retained throughout the stutterwarp travel, even if the two are opposite one another in direction. Typically, therefore, a vessel will make its final approach to its point of destination in such a way as to match the velocity it retains (the orbital velocity from its point of origin) to the orbit it now requires.

As another example, stutterwarp efficiency drops in a gravity field. But this is not a smooth tapering off of efficiency as gravity increases. Instead, there is a sudden drop below light-speed capability at a point when gravity reaches 0.0001 G. A second drop occurs when gravity reaches 0.1 G, reducing stutterwarp efficiency to below that of conventional drives. The reason for these shelves of efficiency is not yet understood. It is, of course, very important for starship crews to be able to predict where these lines occur, but it is also very easy. The surface gravity (in G) of the object being approached is simply divided by the gravity limit being considered (either 0.0001 G or 0.1 G); the square root of the dividend provides the distance from the target object's center (in terms of the object's radius) at which that gravity is reached.

Using Sol as an example, the surface gravity, 27.89 G, can be divided by 0.0001 G for a result of 278,900. The square root of this is 528.11, the number of solar radii at which 0.0001 G is felt. Since Sol's radius is 696,000 kilometers, 0.0001 G can be felt at 367,564,560 kilometers (528.11 radii × 696,000 kilometers) from Sol's center, or 366,868,560 kilometers from its surface (one less radius). This is somewhat over two astronomical units, about the distance from Sol to the asteroid belt. The same formula gives us 10,927,408 as the distance from Sol's surface to the point at which 0.1 G can be felt. Stutterwarp drive efficiency would drop below that of conventional drives at this distance, but this is close enough to Sol (about one-fifth of the distance from Sol to Mercury) that the crew of such a vessel could be expected to have greater things to worry about.

STUTTERWARP DISCHARGE

As a stutterwarp cycles, it builds up a charge residue on tantalum coils within the drive unit. This residue is not dangerous in itself, but once it passes a threshold limit, the tantalum coils begin to rapidly disintegrate, giving off a deadly radiation that cannot be shielded by any presently developed means. In the course of this disintegration, the drive unit is ruined, and any life forms within several hundred meters are killed by the radiation.

The charge residue on the coils can be easily discharged into any significant gravity well. That is to say, if the drive is maneuvered into a gravity field of 0.1 G or greater, it can be discharged. Therefore, a stutterwarp vessel must

approach a body close enough to establish a distant orbit before its drive can be discharged. Unfortunately, this is also the distance at which stutterwarp efficiency drops below that of other drives. For this reason, most starships also have some sort of secondary drive system that allows them to maneuver while this deep into a gravity well. Even starships without secondary drives can maintain orbit by using their stutterwarps to adjust for orbital decay. To leave orbit, these vessels typically plot a trajectory in which they begin to drop toward the body they are circling but are then slingshotted past and out of orbit. Once they pass the 0.1G limit on their way out, their stutterwarps regain enough efficiency to propel them onward. This can be a tricky maneuver, however, and most crews prefer to use some sort of thruster instead.

The stutterwarp's charge residue is directly related to the distance travelled. Some very experienced engineers can calibrate the drives in such a way that the residue is spread very evenly over all components, allowing discharge to be delayed for up to 24 hours and the total distance travelled to be increased, but this is very difficult. For all practical purposes, 7.7 light-years is the limit. This applies even to drives that are on-line but are not propelling the ship. In some of the earliest experiments with stutterwarp, drones were sent out with double drives. Both drives were running, but only one at a time was actively propelling the drone. The intent was to operate the first drive to the 7.7 light-year limit, dump it, and use the second drive to bring the drone back. The drones never returned. It was soon determined that the second, passive drive had also picked up a residue from the cycling of the first drive. Later, manned vessels proved this theory to be true. The only way an inactive stutterwarp drive could be transported without building up a charge residue on its coils was if it was off-line during the other drive's operation.

The difficulty with this is that many delicate elements of a stutterwarp drive are held in magnetic suspension during operation. It takes many hours and quite a lot of skill to bring an inactive drive on-line and calibrate it without damaging or destroying it. (It is even more difficult to take an active drive unit off-line without destroying it.) It is, of course, impossible with unmanned probes. Also, the technique has been relatively unimportant until lately because it presumed that any previously running drive would be jettisoned to prevent it from irradiating the ship. But dumping stutterwarp drives is a very expensive way to travel. Recently, however, another use has been found for carrying an inactive drive.

BREAKING THE 7.7 LIGHT-YEAR LIMIT

Compared to the other two Arms of human exploration, the American Arm is a dead end. No one knows for sure just how far the branches of the French and Chinese Arms stretch; it is possible that they reach to the farthest edges of the galaxy. The American Arm, however, runs to Zeta Herculis on one branch, Ellis on another, and DM – 46 11370 on a third, but no farther. Much effort has been put into breaching these dead ends, and two techniques have recently been developed.

Tugships: The Trilon Corporation recently acquired plans for a stutterwarp tug vessel. This ship is designed to project its stutterwarp field around a ship it tows, allowing the second ship's engines to remain off-line. The tug travels out to 3.85 light-years—half the 7.7 light-year distance—then releases the towed ship and returns to its starting point to discharge. The towed ship then brings its own engines on-line and travels up to another 7.7 light-years—a total of 11.55 light-years distance in all. This technology could expand the number of stars that can be reached to nearly three times the current number.

The problems with tugships are that they are very slow—their drives must move a lot of mass when towing another ship—and there must be a tugship facility at both ends of a route in order to bring the towed ship's engines back off-line and to provide a tug to haul it one-third of the way back in the other direction. (Remember, the towed ship could not travel 7.7 light-years to meet a tug and then be hauled back, for its engines would continue to build a charge residue while it was being towed.)

Brown Dwarfs: Another recent development on the American Arm has been the use of a system to discover the location of solitary brown dwarfs that could serve as discharge points between star systems that are more than 7.7 light-years apart. Near the middle of the 23rd century, facilities began to be built along the American Arm to gather astronomical readings from various locations. By coordinating information gathered at the observatories all along the Arm, astronomical bodies could be located that were previously undiscoverable. Recently, these observatories have turned to the task of locating brown dwarfs. As these brown dwarfs give off very little radiation, they are very difficult for astronomers to locate. By using this system, however, a few brown dwarfs have been identified, and it is expected that more will be found in the future. The difficulties of coordinating such widely scattered observatories are staggering, however, so the program is of limited utility.

STUTTERWARPS AND SENSORS

Vessels travelling at stutterwarp speeds pose special problems in terms of detecting objects around them. Despite the fact that the vessels are effectively travelling faster than light, any electromagnetic means they might use to identify themselves or others are still limited to light-speed. Continuous beacons located on navigational hazards work well, of course, for the same reason that stars can be seen: The emitted energy is present at every point along a starship's route.

But energy given off by a moving starship, whether intentional such as radio messages, or unintentional such as engine heat emissions, will be outraced by the ship itself. Only within a star's gravity well where stutterwarps drop below light-speed do such emissions run ahead of the ship.

Outside of a gravity well, then, by the time a ship is detected, it is too far away to make the information of much use. Inside a gravity well, on the other hand, it can be picked up by a variety of sensors.

Military Sensors: Military sensors, whether passive or active, are intended for one purpose: tracking a target. As a consequence, they can identify a vessel very accurately, but only at short ranges of less than 20,000,000 kilometers.

Navigational Sensors: Navigational sensors can also be used to detect a ship. Each type of sensor has a different purpose and a different effective range, and these individual differences are described below.

Deep System Scan: Deep system scanners collect electromagnetic emissions such as light and heat from objects in a system. They view one narrow wedge of space at a time, and

after many hours of panning across the skies, a picture can be built of what bodies the system in question contains. Deep system scans are very accurate at picking up such things as planets, moons, rings, asteroid belts, and the like. They can also pick up the emissions of a vessel with an actively operating power plant, but cannot identify the vessel for targeting. The effective range for deep system scanners is approximately 150 au, but obviously, the greater the distance to the object being scanned, the less accurate the information concerning its present status and location. Deep system scanners are a passive form of sensor; their operation cannot be picked up by other vessels.

*L*ike the deep system scan, navigational radar will indicate the presence of every body within its range. But where deep system scans focus on one narrow wedge of space at a time, navigational radar sweeps the entire surrounding area and projects it onto a holographic screen.

Gravitational Scan: Grav scanners operate as another form of passive sensor. They register the gravitational fields of local bodies and project them onto a holographic screen. Because of the ties between stutterwarp technology and gravitational fields, actively operating stutterwarp drives show up as a long line on the grav scan screen. Power plant emissions cannot be picked up by grav scans, however, so a vessel at All Stop could be within a few meters of a grav scanner and not be detected. The effective range of a grav scanner is approximately one au.

Navigational Radar: Like the deep system scan, navigational radar will indicate the presence of every body within its range. But where deep system scans focus on one narrow wedge of space at a time, navigational radar sweeps the entire surrounding area and projects it onto a holographic screen. Nav radar will only detect an object's presence, not identify what that object is. It will, however, give away the sensing vessel by the radar emissions it gives off when using the navigational radar. This sensor's range is also approximately one au. It is commonly used for maneuvering in an area where many bodies are present, and many times it is the only sensor mounted on interplanetary commercial vessels.

CONCLUSION

...Construction and operation may not seem very important to the average citizen in the 24th century. But, as can be determined from the above information, these dictate the development of human space exploration, which in turn has a profound effect on our culture and our economy. The realities of stutterwarp technology, therefore, touch all of our lives. Let us appreciate the labor that has gone into developing it into the tool it is today, and let us support the experts who work to improve it and thus open other worlds to the expansion of our race tomorrow.

—Lester W. Smith

Iris

The Imperial Regency of Intelligence and Security: They Also Serve Who Are Not Seen.

Note: This is a **MegaTraveller** variant.

In the year 622, the Imperium was war-weary and drained. For 16 long years, civil war had raged back and forth as the Emperors of the Flag each sat for a brief moment upon the Iridium Throne, only to be toppled by the next ruthless usurper. But Arbellatra, last of the Emperors of the Flag, had a different vision. Upon coming to power, she declared herself the regent, not the Emperor, thereby allowing the first trickle of legitimacy to return to Imperial politics. When she was made Emperor, she largely attributed her success to the image of patriotic responsibility generated by her role as regent.

What is less well-known is her first official act as first Emperor of the Line of Alkhalikoi. Still standing in her coronation gown, she decreed that the Imperium must be guarded against a recurrence of the political adventurism that had brought about the Civil War. Remembering how she herself had restored order to a war-torn Imperium, she established an independent and powerful regent capable of ensuring the smooth succession of the throne's rightful heirs: the Imperial Regency of Intelligence and Security, or "IRIS."

Her choice for IRIS' high regent came as no surprise to any of the Imperium's political elite or to Rhys ap Connor, her friend and consort of 15 years and her intelligence chief throughout the long and trying Zhodani—and Civil—wars.

Arbellatra and ap Connor had learned the key lesson of the Barrack's Emperors period: The throne could not be trusted to the tender mercies of ambitious naval commanders. What was needed was an independent, invisible force with the power to eliminate individuals who would contest the lawful Emperor or his/her successors. In addition, ap Connor was farsighted enough to urge Arbellatra to expand IRIS' mandates to include responsibilities that needed the Regency's organizational independence and secrecy, namely, covert operations dealing with foreign powers. The endemic bickering and rivalry between various services—Navy, Scouts, Army—made it essential that there be at least one powerful covert organization at the Emperor's disposal that had no political axes to grind. Pursuant to keeping IRIS free of outside intrigues, ap Connor restricted the social level of prospective IRIS appointees to a maximum of 10 and a minimum of five—a solid middle-class composite. This angered many ambitious nobles who had hoped to exert some control over the Regency by insinuating some of their own family members into its ranks. Ap Connor's demographic analysis had shown that middle-class individuals tended to evoke far greater loyalty to the Imperium as a sovereign state than they did to any individuals that supposedly embodied that power. This individualistic predisposition also seemed markedly stronger in individuals of Solomani heritage than in the more code-bound Vilani. This resulted in an unusually high percentage of ethnically Solomani names in IRIS' duty rosters.

Predictably, ap Connor was the center of controversy, ranging from rumors about his being a secret Solomani supremacist to his plotting to overthrow the throne he was supposedly protecting. Even the motto he gave IRIS, *Custodiamus Veritas*—"We Guard the Truth"—(from the ancient Solomani Latin dialect), was the target of a play on words. The Regency's detractors revised it into a slightly different Latinism; *Quis Custodes ipsos Custodiet?* or: "Who Shall Guard the Guards Themselves?" Despite the exemplary service IRIS has unflaggingly afforded the Emperor and

the Imperium, that nagging question still remains in the minds of many; given its unusual powers and insular nature, who could tell if IRIS is abusing its powers or not?

This issue became a matter of hot debate in 879, when an investigation into the Psionic Suppressions revealed that the two Psionic Institutes that had not had their charters revoked (Terra and Regina) were both being used (among other things) as training and testing centers for certain IRIS covert operatives. A general furor over this discovery compelled the Emperor and the high regent to disclose that IRIS did employ psionics on a very limited basis, pursuant to carrying out its second mandate. IRIS employs psionics in other ways also, but it was felt that a limited disclosure would satisfy public curiosity. It did.

OPERATIONS

IRIS has never published any numbers regarding the number of individuals on its duty rosters, but most estimates place the total between 300,000 and 400,000—a small force, given the size of the Imperium.

As an organization, IRIS is hard but fair. IRIS will go to the limit when trying to protect or recover an operative; there is a powerful sense of internal loyalty and *esprit du corps*. Conversely, defectors or double agents (whether they are actual IRIS personnel or "on-site recruits") are, without exception, terminated at first expediency (they may be permitted to live long enough to compromise their associates via contact).

The Branches

There are three branches in IRIS: Covert, Strike, and Operations. It is estimated that 65 percent of IRIS' manpower is in Operations, 25 percent in Strike, and 10 percent in Covert.

The Covert Branch: This branch handles all clandestine activities and is generally considered to be the "elite" of IRIS. Appointment prerequisites are high, training is demanding, and missions are hazardous. Fifty percent of Covert assignments involve substantial travel (or residence) outside the Imperium's borders. The nature of their assignments varies from living a calm, undercover life in a foreign society while quietly gathering information, to sabotage and assassination. Covert operatives must be willing to give IRIS a substantial commitment; when they accept their appointments, they are signing up for 20 years. Not surprisingly, morale is extremely high in this branch, and their self-given motto, "They Also Serve Who Are Not Seen," reflects their status in Imperial eyes: invisible soldiers who fight an invisible war.

The Strike Branch: This branch functions as the "commandos" of IRIS. Their missions are primarily military in nature, involving either the security of highly sensitive installations/individuals or surgical strikes against sensitive targets. They rarely operate in units larger than platoon size, and usually conduct missions in squad- or fire-team size elements. Many military experts hold Strike operatives to be the finest troops in the Imperium on a man-for-man basis.

The Operations Branch: This branch is the foundation of IRIS. Operations personnel conduct the more "mundane" aspects of intelligence work. They are charged with data gathering, surveillance, tactical analysis, policy formation, and liaison work. They are frequently assigned as intelligence officers for Imperial embassies. They also provide IRIS with the majority of its medical personnel.

Special Conditioning

In addition to IRIS' normal operating policies, there are two areas of "special conditioning" that a select number of Covert operatives undergo. One area is anagathics maintenance; the other is psionic testing and training. Needless to say, neither are "advertised;" they comprise the most confidential of IRIS' operating procedures.

Approximately five percent of the Regency's Covert operatives are on some schedule of anagathics maintenance. In the majority of cases, this involves a "slowing down" of the aging process. In a very few cases, it is arrested altogether.

The most important—and the most obvious—reason for this is the fact that younger skin is more receptive to repeated bouts with extensive plastic surgery. Even though TL-15 can work wonders even with elderly facial tissues, younger tissue is more pliant, more resilient, and more frequently alterable.

Less obvious but equally important is what the Regency refers to as "baby-facing" their agents. In brief, analysis of intelligence operations showed that younger individuals were less likely to be identified as suspects in connection with crimes of espionage or sabotage, and that the more sophisticated the crime, the lower degree of suspicion placed on younger persons. Accordingly, IRIS takes steps to keep a number of its Covert agents "young," a tactic that additionally forces opposing intelligence services to consider a greater number of suspects, thereby complicating—and slowing—any investigations.

The second area of special conditioning—psionic testing and training—is among the best-kept secrets of the Imperium. The value of psionics to any intelligence operation is obvious, but telepathy allows for foolproof loyalty checks. In a business where double agents and moles are the greatest dangers, the importance of this aspect of psionics becomes critical. IRIS tests all Covert operatives for psionic potential and telepathic talent immediately upon appointment, albeit under the influence of drugs that interfere with the memory. Regardless of the outcome, the operative's foggy memories of this testing are hypnotically and psionically suppressed.

Upon completing their 20 years of field service, those Covert
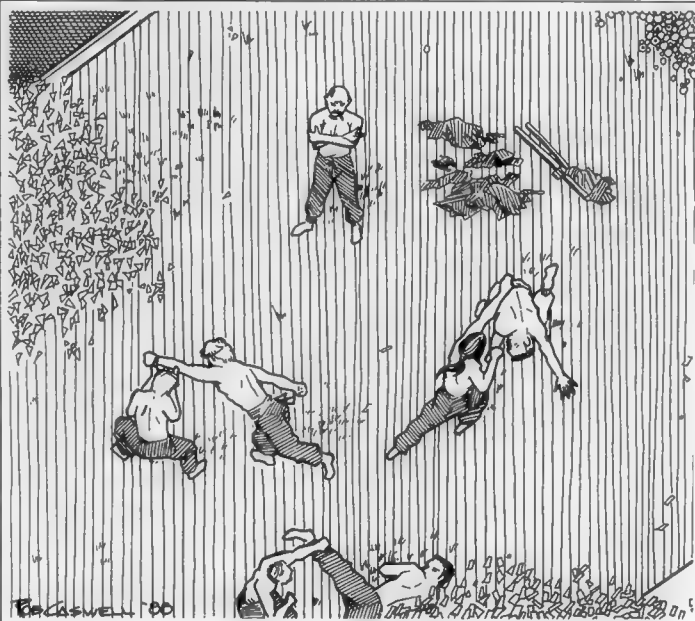
operatives who elect to advance into IRIS' Directorate (the general ranks, if you will) have their memories restored and telepathic training is completed at that time. These directors then serve, among other things, as "loyalty checkers." While it is common knowledge that such checks are surreptitiously made of all persons who are to be granted a personal audience with the Emperor, it is not known that similar checks are carried out regarding IRIS' own agents. The directors and even the regents themselves are subject to periodic checks which provide insurance against high-echelon subversion.

ORGANIZATION

IRIS' nerve center is in the Core sector. IRIS provides the Emperor with personal security in the form of unobtrusive psionic screening of all persons who have been granted an Imperial audience, as well as a number of Covert operatives in various positions within the palace. The high regent and the 10 senior regents remain in Core sector at all times, directing IRIS' strategic level operations at the Regency's headquarters. However, only one regent is stationed on Capitol itself, and the high regent rarely visits that planet. In this way, any natural—or "man-made"—catastrophe that might take the Emperor's life will not also kill the high regent and his successors.

It is at Core headquarters that most of IRIS' long-range strategic planning and information analysis is done. It is also the central marshalling area for Strike operatives, which simultaneously gives the throne a powerful, independent combat force in close proximity.

The next organizational tier is comprised of the Domain-level command centers. These centers compile and organize reports from the various sectors under their jurisdiction and then forward them to Core. They also oversee general assignment of personnel and dissemination of broad tactical goals to their various sectors. Non-senior regents and senior directors are in charge of these centers.

The last structured level of organization within IRIS is the operations center, which is assigned one to a sector. These operations centers are run by senior directors. They are the "grass-roots" loci of IRIS. Given the nature of travel times, the senior directors of operations centers are permitted an extraordinary degree of independent action. They initiate all types of projects, assign Covert operatives, set intelligence agendas, designate essential targets—in all, they oversee 90 percent of IRIS' field operations.

They also assign and establish what are known as "project offices." These are the in-field command and control centers used to support ongoing projects. Such offices may be essentially permanent or may exist for less than a month, depending on the nature, complexity, and duration of the project(s) that they are supporting. Run by directors and heavily staffed with Strike operatives, these offices are Covert operative's "link" to IRIS. In support of clandestine operations, they provide personnel to facilitate information drops, supply and reinforce undercover agents in the field, and function as safe houses.

Upholding the Five Mandates

The five mandates of the Regency constitute its reason for being. As such, it becomes important to have a general understanding of the mandates and how IRIS upholds them.

Mandate 1) Ensure and enforce the smooth and lawful succession of rightful heirs to the Imperial Throne. In the event of an interregnum, IRIS is to act as regent *pro tem* until a legal heir is located and/or reaches the age of his/her majority.

Pursuant to the fulfillment of this mandate, IRIS maintains extensive records on all possible successors to the throne. It also keeps extremely well-informed regarding every aspect of the Imperium's political, economic, and military condition in the event that the Regency would have to provide sovereign leadership during an interregnum.

But perhaps the most interesting and controversial activity initiated under this mandate is the Regency's "overseeing" of naval fleet commanders. In short, IRIS maintains two to three undercover operatives on the shipboard staff of every fleet commander in the Imperium. Their mission is twofold: to prevent the commander from using the fleet in a bid for the throne, and to prevent general mutinies, whatever the motive. The reasons behind this activity are clear; whoever controls the fleets controls the Imperium. The Barracks Emperors proved that beyond argument. Equally clear is the Navy's general resentment; they have always considered it a blow to their pride that they have to be watchdogged by an independent agency. However, given the number of mutinies that IRIS operatives have prevented over the past six centuries, many fleet commanders actually take comfort in the knowledge that they have a couple of guardian angels somewhere on board.

Mandate 2) Prevent "unreliable" individuals from gaining direct access/proximity to the person of the Emperor.

IRIS fulfills this mandate by providing surreptitious psionic screening of all persons who have been granted an audience with the Emperor. They also maintain sporadic surveillance and detailed files on all Imperial intimates and palace staff.

Mandate 3) Check and compare all information relayed to the Emperor against IRIS' own independent sources.

IRIS achieves this by funneling information from the sector-level operations offices into headquarters in Core and then comparing it to the reports made to the Emperor by the various services (Navy, Scout, Army, Foreign Service, etc.). IRIS notes any contradictions and offers any data it might have on any subjects that are vague or confused by conflicting reports. This increases the reliability of information received by the Emperor and strips away any misrepresentations that might stem from the vested interests of a given service (the Navy is renowned for "weighted" reporting).

Mandate 4) Identify all significant anti-Imperial covert activities initiated by foreign powers. Formulate and expedite responses thereto.

This mandate accounts for at least 80 percent of IRIS' Covert and Strike activities. These activities are conducted primarily at the sector and subsector level and involve some of the dirtiest, nerve-wracking work in all of known space. One of the most interesting features of IRIS' activities in upholding this mandate is the relationships that have evolved between the Regency and numerous outlaw Psionics Institutes. A perennial hotbed for Zhodani infiltration attempts, the Institutes provide IRIS with an excellent opportunity for monitoring Zhodani activities within the Imperium.

Therefore, IRIS permits the Institutes to exist but makes certain members aware that the Regency is in fact aware of, and

permits, the Institute's continued existence. However, in return, IRIS expects the Institute's cooperation. The results of that cooperation have been spectacular. Although this is a controversial tactic, IRIS maintains that if you know where the Institutes are, you can monitor them and make sure that nothing gets out of hand. Only when you start closing them down do you drive the problem deeper underground, where you can no longer keep tabs on it.

Mandate 5) Conduct and maintain covert activities in foreign territories, pursuant to ensuring the security of the Imperium.

IRIS has had to carry out increasing numbers of these operations over the past two centuries in response to requests which come not only from the Emperor, but from the military services. The reason lies in the increasing destructiveness of general warfare. The more advanced technology becomes, the more expensive and debilitating war becomes. Decisive results become obtainable by the implementation of forces that also annihilate most, if not all, useful resources. Consequently, the cost-effectiveness of overt military confrontation decreases. As a result of the decrease in the cost-effectiveness, war increasingly moves into the realm of clandestine operations: surgical strikes, sabotage, and assassinations. The attainment of limited but key objectives becomes paramount in the ongoing struggle between interstellar powers. Accordingly, IRIS' activities in these areas have risen, particularly since the Rim War.

A note on Mandates 4 and 5: IRIS is not the only agency that engages in such operations, but it nominally oversees and coordinates all such activity. The Scout Security Branch is very cooperative in this regard, Navy Intelligence less so. However, they generally don't mind this arrangement; neither the Scouts nor the Navy has the resources or inclination to make clandestine operations their first priority. Therefore, IRIS gets the most difficult jobs and bears the final responsibility.

Retirees

Most operatives do not opt (or qualify) to continue into the ranks of the Directorate. This does not mean that their relationship with the Regency comes to an end. All operatives—particularly former Covert operatives—are monitored to some extent to the day they die. The more ambitious and sweeping their post-Regency ventures, the more they are watched. IRIS requests that former operatives who engage in "volatile personal projects" (i.e., get involved in any high stakes, high risk ventures) keep the Regency informed as to the general nature and direction of their activities. If this good faith cooperation is given, IRIS is fairly lenient regarding its former employees. In cases where the activity is clearly pro-Imperial (particularly where the activity meshes with Regency goals), aid is occasionally supplied, primarily through the removal of red tape.

However, the majority of retiring operatives seek more traditional employment, usually as intelligence chiefs for planetary governments or megacorporations. It is worthwhile to note that almost 20 percent of IRIS retirees find employment with Hortalez et Cie, perhaps the largest Imperial megacorporation. IRIS and Hortalez have strong ties dating back to IRIS' inception. Megacorporations in general and Hortalez in particular (given its enormous investments in other firms), strongly desire the governmental stability that IRIS was formed to ensure. Not surprisingly, eight of IRIS' 10 private-sector economic advisors are Hortalez executives.

RECENT HISTORY AND CURRENT SITUATION

The following details recent history and current situations.

Postwar Changes

In the wake of the Fifth Frontier War, IRIS' fortunes changed for the worse. Elated by the news of victory and brimming with confidence, many people began claiming that this latest victory in the Marches conclusively proved that "psionic powers have been proven inferior to the abilities of normal men." A number of nobles—including an especially vehement contingent from the Illelish sector—were particularly vocal in this regard. This general self-congratulatory attitude grew, and by 30-1115, it had metamorphosed into requests that the Emperor do away with IRIS' pre-audience psi screening. IRIS found itself in a position where it could not offer a rebuttal. Psi-sensitive Directors had played a key roll in ensuring the victories attributed to "normal men," but it was impossible to point out how psionic powers had ensured victory without compromising the secrecy of those powers. After much discussion, IRIS volunteered to remove itself from palace security if Strephon so desired. This offer made life easier for the Emperor, who had no desire to "dismiss" IRIS after six centuries of faithful service. But given the political pressures, he accepted the offer and nullified IRIS' second mandate.

The sudden increased attendance of certain nobles at court after the removal of psi-screening began to concern IRIS by late 1115. The Regency found itself in accord with its traditional adversaries, the nobility, when it made recommendations to the Throne against the appointment of Dulinor of Dlan to an Archducal seat. As the weeks passed, the writing on the wall grew clearer, and any lingering doubts finally vanished on 124-1116. On that day, the high regent received word from the undercover overseers in Admiral Hutara's (Dulinor's brother) fleet staff that a number of coded communications directed to Hutara himself had been detected. However, the code was not one used by the Navy; in fact, it was completely unknown. Additionally, a large number of shore leaves had suddenly been granted and others postponed, with the net result of keeping all pro-Dulinor personnel fleetside. After a 12-hour conference

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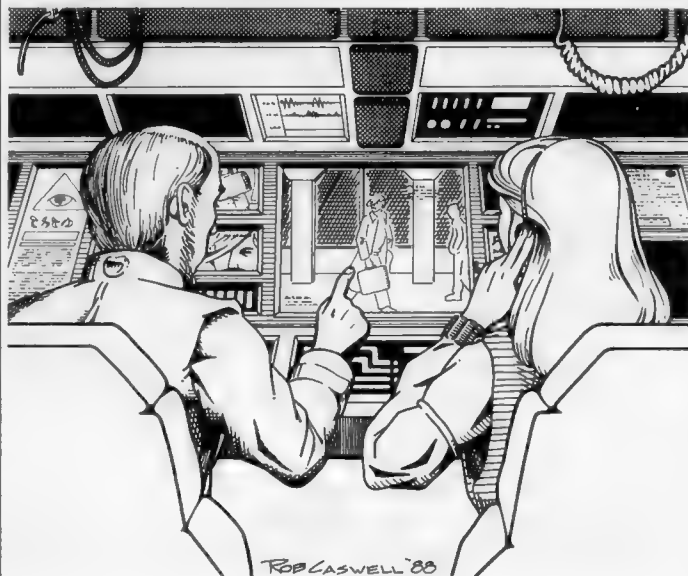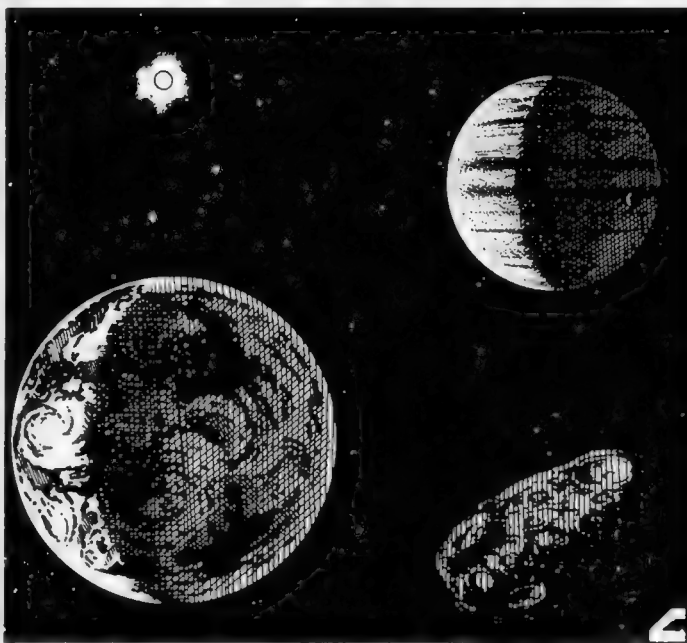
with three senior regents and various high ranking analysts, High Regent Garran Trainor-Hughes ordered that the Emperor be sent a direct warning and that IRIS' pre-interregnum contingency plans be put into effect. Jump-6 couriers were dispatched immediately, bearing instructions for IRIS forces to begin concentrating in the Marches, Core, and Rim.

The Assassination

But the warning to Strephon arrived too late. At the time of the assassination, the Regency was still planning to take charge in the event of an interregnum. However, the senior regent stationed on Capitol was killed at his home minutes before the assassination took place. Therefore, by the time news reached the next available senior regent, news of Lucan's questionable ascension and the concurrent unrest in the Moot were only days behind. After considerable discussion, it was decided that the high regent would remain in the Core sector with a skeleton staff and two companies of Strike operatives. It was his duty to attempt to determine the legality of the current succession situation. The remainder of IRIS' resources evacuated the Core and launched into their worst-case contingency plan: establishing and preserving a power base from which to rebuild the Imperium in the wake of a civil war.

Activation of IRIS' Contingency Plans

The vast majority of IRIS' resources moved rapidly to the Solomani Rim sector. There, in cooperation with Hortalez et Cie (and other megacorporations largely owned by Hortalez, notably, Instellarms, Ling-Standard Products, and Sternmetal Horizons), the Regency consolidated a strong position centered on the Concord, Esperance, and Vega subsectors. Next, the Regency exercised its interregnum powers of Mandate 1 to assume command over the Rim fleets. Although at first this was resisted, the aggressive Solomani reaction to the news of the assassination made the commanders think again. Within a week, the Rim admirals were gladly acknowledging IRIS' claim. In an independent statement, they concurred that since Lucan had not received the Moot's consent, power legally reverted to the Regency. Of course, this high-sounding reasoning had little to do with the fleet commanders' decision for siding with IRIS. Quite simply, the area secured by IRIS offered them a secure support base for their fleets, a superb defensive position, and a legal excuse to refuse any orders that would compel them to join the multi-sided naval meatgrinder developing in the Core sector.

Spinward operations were placed on an independent footing under the guidance of the most senior regent there. He immediately put his resources at the disposal of the new Archduke of Deneb (Duke of Regina) in order to assist the Marches in resisting advances by foreign powers.

As the situation at Core deteriorated and it became evident that Lucan's actions had stalemated whatever chance there was for a legal resolution to rightful succession, the high regent relocated to the Rim, leaving the third most senior regent to assess succession claims and feed information to the interregnum headquarters in the Rim.

The Rim area selected by IRIS was quickly forced into becoming, for all practical purposes, an independent state, when the first Solomani incursions tested the Imperial borders. Calling itself the Regency Concordiat (with a provisional capitol at Eleusis: Concord 0509), IRIS' fledgling policy hit hard at the first tentative Solomani probes, stopping them cold. Then, while the Solomani Confederation was still regrouping for what it feared would be a long and costly assault, the Concordiat offered a truce, including a negotiated withdrawal of all Imperial forces from several sectors. a move that ceded Terra itself (and thus cooled the Solomani war fever). Wary but glad to be able to bypass the consolidated naval power of the Concordiat (supported by 14 naval bases, and the Depot system, Vega 0301), the Solomani agreed to the truce, occupied the ceded areas, and then swept past, eager to make deeper inroads against more vulnerable targets. (Current Concordiat boundaries are indicated on the map on page 31 of *Challenge 30*, "The Rebellion Begins.") This outcome was a major reassurance and relief to the Vegans, who, being long-lived, had very clear personal memories of how nonhumans fare under the humanocentric Solomani Confederation. Equally significant, IRIS' diplomatic maneuverings had minimized military losses, thereby preserving the Concordiat's forces for future defense.

Future Goals

IRIS' primary goal is to rebuild the Imperium, although perhaps along the lines being espoused by the Federalists—with the Emperor as wielder of various vetos—rather than as an absolute autocrat. In reforming the Imperium, the Regency would also like to bring about an agreement that might include peaceful reintegration with the Solomani Confederation.

The Regency is still attempting to identify any legitimate successors to the Throne, with the intent of offering them protection during course of interregnum. However, were a potential "successor" to order IRIS to bring forces to Core, the Regency is prepared to refuse on the grounds that approval by the Moot is necessary before any successor can be legally recognized as Emperor. Until then, the Regency retains responsibility for, and control over, Imperial resources it has been able to preserve. Under no circumstances will it jeopardize the well-being of the Concordiat, which may yet turn out to be the last bastion of civilization and high technology in the Rim.

Despite a general war footing, the Regency Concordiat is attempting to build strong trade relations with the Confederation. It is the Concordiat's strategy to become an essential trade partner to the Solomani, thereby discouraging any future attacks which would inevitably jeopardize that relationship.

Possibilities for Play

The possibilities for play as an IRIS character of any branch are obviously limitless. A few interesting scenarios might include:

• Security and liaison work on Ludmilla (Esperance, 0406), where the human supremacist party that is currently in power is highly upset over the Concordiat's strict insistence on equal rights for all sophonts. Characters might have to protect an important Vegan political leader or infiltrate and dismantle the supremacist faction.

Despite a general war footing, the Regency Concordiat is attempting to build strong trade relations with the Confederation.

• Work as a courier to and from the IRIS elements still in the Core sector. Various complications could arise, including having to travel undercover to avoid Dulinor's people (who take a very dim view of the Regency), avoiding Solomani forces, or having to help against the sudden outbreak of commerce raiding that threatens all interstellar transport.

• Quelling Solomani uprisings on a number of planets throughout the Concordiat, particularly Herakles (Dingir 0202), where there is strong evidence that the rebels are being supplied directly by the Solomani. Putting down the rebels could include cadre work with local militia, infiltration of the rebel underground, or surgical strikes against their leadership.

• Counterstrikes versus Vargr raiders that are pushing over into the Deneb sector. This situation could also include intelligence gathering in Vargr space as part of an effort to attempt to predict exactly where the next major strikes will be located.

• Providing security on a Concordiat trade mission to the Near Bootes Cluster (Capella sector) that is a part of the attempt to build economic ties with some of the more influential planets in the Solomani Confederation. Possibilities for this include attempts at sabotage, ambushes, even a double agent on board who is working for an ultramilitant Solomani faction that wants to keep relations with the Concordiat from becoming amicable.

• The character is on Embassy assignment in Solomani territory when news of the assassination arrives by secret Imperial courier—he hears the assassination announcement only 24 hours ahead of when it reaches the general news. His present job is to evacuate the embassy and also to keep ahead of Solomani pursuers until such time as the Imperial border can be crossed.

—*Charles E. Gannon*

Editor's Note: Watch the next issue of *Challenge* for "IRIS Character Generation."

Challenge Writer's Department

Challenge is always growing and changing, and we like to keep our active subscribers abreast of what's coming up. If you would like to get more involved in *Challenge*, here are three items which may interest you.

New Writer's Guidelines

The editorial staff has created new writer's guidelines for *Challenge*. They contain everything a writer will need to know to give an article the best chance of making it into publication. There are also suggestions for submitting articles on computer disk, when possible. Even if you have our old guidelines, you should probably obtain a copy of the new set before submitting your next article to *Challenge*.

Since the magazine is growing in size and expanding its scope of coverage, we are, more than ever, looking for new writers. We would like to encourage all potential authors, regardless of experience, to break out their word processors or typewriters and get involved with the magazine. Provided a submission adheres as best it can to the new guidelines, it will be given equal consideration for publication in *Challenge*.

To obtain the new guidelines, please send a stamped, self-addressed envelope to *Challenge* Writer's Guidelines, c/o GDW, PO Box 1646, Bloomington, IL 61702-1646.

E & C

You may have noticed that we have started an irregular feature in the magazine known as E & C (for Errata and Corrigenda). It's the new home for pertinent clarifications of games we cover in the magazine. If there are any specific errata you would like to see, drop us a line to that effect.

Letters Column

Starting soon, we hope to begin bringing you a letters column. If you have comments on the magazine or on games in general, form them into a concise letter and send it in. All letters will be considered for publication, but all are subject to some limited editorial control. A bit of advice—don't become too wordy. We would like to fit as many letters in as possible without taking up too much of the magazine. If you have questions about an article or a game, or if you have comments which you feel you would like to share with the rest of *Challenge*'s readership, the opportunity is in the making for you to express yourself. Send your letters to *Challenge* Letters Column, c/o GDW, PO Box 1646, Bloomington, IL 61702-1646.

Living Steel: High-Tech Role Playing System.™
Leading Edge Games. $24.95.
Principal Design: Barry Nakazono
Game Design: Mike Alford, Robert Calvet, Clay Clement, Malinda Clement, Ron Hanson, Phil Markgraf, JJ Wolf
Illustration/Graphic Design: Jon Conrad, Toni Dennis, Steve Huston, Scott Miller, Maggie Parr
Boxed game set. Three books, map, character sheets, and die. For referee and one or more players.
August, 1987.

Review

Living Steel is a game set on a world wracked with turmoil in an empire fighting a war for its life against strange, genocidal aliens called "Spectrals." The odd twist to this situation is that the character you generate would prefer to see the empire, known as the Starguild Empire, fall, but this does not place him or her in alliance with the Spectrals. The character you play in *Living Steel* stands behind age-old concepts of freedom, independence and individuality —aspects of the human spirit which the corrupt caste system of the Starguild Empire has attempted to crush out of existence. In *Living Steel* the group your character works with is attempting to revive these old concepts. First, however, you have to rescue the society of the planet you are on, Rhand, from the aftermath of a Spectral attack.

There is certainly a lot going on in the universe which Leading Edge has set up for their *Living Steel* game. The potential for "high adventure" which the company claims is certainly there, but it may be hard for referees to achieve for their players with the materials presented in the game set alone.

CHARACTERS

Characters in *Living Steel* come in two basic types: Ringers and Alpha Team members. Ringers are actually not from the time in which *Living Steel* takes place. They are heroes of the Seven Worlds system, a star system which embodied the noble principles mentioned above and which fell after a long rebellion against the encroaching Starguild. The Seven Worlds fell 150 years ago, and Ringers have been secretly kept in stasis after being rescued from mortal wounds sustained on the battlefield, awaiting a time and place appropriate for resurrecting the ideals of the Seven Worlds.

Alpha Team members are inhabitants of Rhand who lived through the Spectral Invasion because they were in stasis on an ORCA (Orbital Remote Commuter Access—part of an electronic teleportation transportation system) satellite. Alpha Team members were formerly paramedics, firefighters, search and rescue team members, and others whose occupations might require them to be almost instantaneously anywhere on Rhand at a moment's notice in an emergency.

Characters of either type are generated similarly. A random number is generated by a die roll and added to a base number. This total number of points is used to purchase a character's Primary Characteristics (Strength, Agility, Intelligence, Will, and Health). For instance, it costs 11 points to purchase a Strength of 11, while it cost 21 points to purchase a Strength of 18. Costs are detailed on a chart. This allows some personalization of

a character according to player preference. Secondary Characteristics (Charisma, Leadership, Motivation, Size, Teaching and Telepathic Sensitivity) are generated by totaling the rolls of 3D6 for each characteristic. After Secondary Characteristics are rolled, a different chart or set of charts is consulted for each of the two types of characters. From these charts, history, occupation, age, skills, and awards are determined in a manner somewhat reminiscent of **Traveller**. Players then are assigned or pick equipment for their characters. Further characteristics which are derivatives of those already given above are then calculated. Finally, Professional Skills such as computer operation or electrical repair are purchased, using points from a point pool derived from already calculated characteristics.

The generation procedure results in very detailed characters. However, it takes quite a bit of time, and the game charts are absolutely crucial to it. The result is that speedy character generation for pickup games is difficult, especially if only the referee has a copy of the rules, as is often the case with a relatively new game. Also, the multitude of characteristics which characters possess leads to some characteristics which are rarely consulted or relevant—no one I know of has used his Teaching characteristic yet. Also, setting up characters with so many skills leads to another problem—disappointment when players discover that the premise of the campaign world is that they will not get to use some skills much, if ever, because of a current lack of equipment which they need to practice those skills. (For instance, a character can know how to pilot a grav vehicle, but grav vehicles are rare, and fuel even rarer.)

RHAND

The setting which Leading Edge details for *Living Steel* is Rhand, which has just been devastated by invasion and bombardment from orbit by the Spectrals, and release of a virus which renders individuals permanently sociopathic. The result is that Rhand has all the disadvantages of a planet which has just experienced a nuclear war, but without the radioactive fallout. Supplies and food are low and getting lower, with no way to make newly manufactured items in sight. The Spectral Invasion of the Starguild has cut off Rhand from the rest of the Empire, so no relief is forthcoming. The generally high level of technology on Rhand, which was a vacation planet, means most powered items ran on battery packs which had a limited life or were connected to a microwave powernet that formerly beamed power planetwide but is now patchy. Even transportation is a difficulty because Rhand depended on its high-tech ORCA teleportation system for instantaneous transport, and the ORCA has been almost ruined by the Spectral bombardment. With ORCA, there was previously little need for vehicles, so land transport capable of any long distance travel is scarce. These problems are complicated by the human element, which includes humans who have become "Vissers"—victims of the Spectral virus—whose problem-solving solution is violence.

This privation and recovery gives great impetus to adventures, such as those already exploited by such games as *The Morrow Project* and **Twilight: 2000**. However, some of the nicest character equipment in *Living Steel*, the equipment which *makes* a Ringer character, is Power Armor, which can do

incredible things but needs power (its battery pack's charge lasts about one day), which there is now less and less of on Rhand. So Power Armor can only be used in rare situations. Ringer characters who can use Power Armor are too valuable to risk on nonpowered missions because the surgical implants which let a person work Power Armor are not available in the aftermath of the bombardment. The result is that most Ringers which players create will be played infrequently at best—a frustrating situation since these are the most detailed, motivated and best-equipped characters one can generate.

COMBAT

The *Living Steel* combat system is derived from another Leading Edge product, *Phoenix Command*, a combat system for use either with miniatures or as the combat system of any modern role-playing game. Combat in *Living Steel* is supposed to be fully compatible with that system and its supplements. Leading Edge claims its combat system to be a "system which does away with 'Hit Points' and brings you realistic, intense man-on-man action." Realism, as much as can be achieved with fictitious weapons, is certainly a quality of this combat system. All action is carried out simultaneously within phases only a few seconds in duration. The combat system features a detailed hit location system, modifiers to basic hit chance based on skill, distance from target, whether the firer or target is moving, the stance of the target and firer, cover, whether fire is automatic or a single shot, and the inherent accuracy of each type of weapon. It also features "realistic" damage amounts based on the location of a hit, the power of the weapon (and type of ammunition) which hit, and any armor the target might be wearing.

However, although the combat system is realistic, the methods used to achieve this realism lead to it being very complex. Every combat involves consulting a minimum of eight tables. A combat which takes seconds or minutes in game time can take a half hour or more in real time quite easily. It is not possible to use the combat system without resorting to actual measurement of range from target to firer in scale hexes or yards—there is no simple declaration of short, medium, or long range possible. The need for measurement makes it mandatory to map battle areas to scale and preferable to use a hex grid to do so, but no hex map or even photocopyable hex grid is provided in the game. Battles must be carried out using physical representations of the combatants, such as counters or miniatures, in order to fully utilize the combat system, and this takes up a great deal of space at typical combat ranges (and often more space than the typical role-playing gamer has on his or her table). Finally, while damage is realistic, it is also incredibly deadly. The average character can easily die in his or her first combat from only one realistic wound. Those characters who are wounded and do not die are laid up for realistic, lengthy healing periods. This much realism can easily lead to bored and frustrated players due to frequent character death and incapacitation and time-consuming, complex combat sequences.

HIGHLIGHTS

Living Steel is marvelous to look at. Graphically, it is a very attractive game. The history and background of the Starguild Empire and the circumstances which led to the current game situation are interestingly and adequately covered. The "quotes" of famous historical characters in the game which are featured as sidebars throughout the text of the main game book are intriguing and humorous. The ORCA teleportation system adds a twist to a typical post-holocaust situation, as the player characters have access to the only functioning ORCA satellite, and thus to the capabilities of instantaneous travel, within certain limits. The game's Karma system, a system which takes the goals and ideals of a character beyond the character's death, is an interesting goad to Seven Worlds' characters to fulfill their (now-dead) society's goals through heroic adherence to those goals (and it may also serve to placate those players who frequently lose characters due to the combat system). Tables and charts necessary to the game are included in one separate book, not buried throughout the text of the game, and are therefore easy to locate. The world map of Rhand is readable and useful, with important locations clearly marked.

PROBLEMS

Living Steel presents a long sequence for determining the condition and status of remaining communities on Rhand—a sequence which referees should save themselves the trouble of proceeding through as it generally tells one, in the end, that only one percent to five percent of anything important is left. The tables devoted to this sequence and the nine pages devoted to detailing *ad nauseum* the materials and skills necessary for construction and repair of items and structures could have been devoted to more useful information. What gamer really cares how many pounds of steel and how many screws and springs it takes to make a new gun, anyway? One useful table detailing the prebombardment population in communities on Rhand and their current status reveals a large discrepancy between the number of communities shown on the world map of Rhand and the number listed on the table. Resolution of actions using noncombat skills will often have to be adjudicated by the referee through inferences drawn from examining a chart—the woefully inadequate Action/Reaction Table provided—which probably does not cover the action desired.

EVALUATION

Those who really enjoy realistic combat and do not mind complexity and a slower combat sequence in pursuit of it will truly enjoy *Living Steel*. *Living Steel* includes a detailed history and technical information on its combat equipment, such as Power Armor and all the weapons used in the game, which will prove intriguing for those people who are small arms buffs or who find the progressive development of military equipment interesting, if they can project their interests into a futuristic setting.

But, *Living Steel* is a game of mixed quality. It has potential for being an exciting and intriguing game milieu but should only be played by people who have some gaming experience. New gamers and referees may become lost in the game's complex combat system. Potential referees should note that ideas for adventures are not presented in detail and rely mainly on rather complicated Mission Generation tables, a sort of random scenario generator system for the bare bones of an adventure. Unless a referee wants to run a massive random encounter table as an adventure, considerable referee originality

and thought will have to be put into creation of adventures. Referees may discover that they are "winging" decisions on the success or failure of most noncombat actions—something which may make inexperienced referees feel very insecure. Overall, *Living Steel* has a fascinating historical setting, wonderful equipment, detailed character creation, problematic game systems, and little support for the referee.

Operation Seven Swords.
Leading Edge Games. $7.95.
Supplement to *Living Steel.*
Principal Design: Barry Nakazono
Writing: David McKenzie
Game Design: Robert Calvet, Clay Clement, Irene Kinzek
40-page module-style book.
August, 1987.

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This supplement to *Living Steel* presents more details on the "universe" of the *Living Steel* game. The history and nature of the Seven Legions of the Seven Worlds army are described, along with the types of missions they normally performed when on active duty. More detailed explanation of what makes a Ringer character special is provided, including explanations of Ringers' biomodifications, Virca (a telepathic ability of some Ringers involving biofeedback), and Professional Skills for Ringers. Noncombat Ringers such as medics, operations personnel, and technical support personnel are described. Alpha Teams are more fully developed, expanding on the *Living Steel* rules with extensive job and skill descriptions, lists of special equipment, a section on Alpha Team dependents, and another on individualizing Alpha Team members. The ORCA is explained in more detail to better understand its capabilities and limitations and its role in communications. An ORCA Operation Schedule chart is included to help players and referees better visualize its operations. Further essays on Starguild society are presented, as is a beginning scenario—"The Awakening." Also included are a Professional Skills Table and a Skill Tradeoff Table which show what Professional Skills characters of certain backgrounds are likely to have and which recreational skills may be able to substitute for certain combat skills if necessary.

EVALUATION

Operation Seven Swords is well-written and useful. In fact, it is so useful, one wonders why the information included in it was not included in *Living Steel*. It clarifies many vague points in *Living Steel* and provides substance to information which was often previously merely a title on a character generation chart. The one problem with this supplement lies in the way certain items of information in it mesh with the *Living Steel* rules. Specifically, it is not clear whether skills assigned to a profession on the Professional Skills Table are *in addition* to those that a character buys with the points he or she has to buy Professional Skills with in the original rules, or if they are *mandatory* purchases for characters to make with those points, with other skills being chosen with points left after their purchase. Also, the use of the Skill Tradeoff Table is vague and can easily be abused in what would seem to be a twisting of the rules. It is not clear whether levels in the Recreational Skills

which are "traded off" to achieve levels in another skill result in actual, permanent levels in that skill which one can increase through experience or whether they are only substitutions for the actual Combat Skill until it is bought, or even whether they are cumulative with each other (can one take a level in Gun Combat gained through Hunting and add it to a level in Gun Combat gained through Archery and achieve Gun Combat level two?).

KViSR Rocks!
Leading Edge Games. $9.95.
Game Module for *Living Steel.*
Principal Design: Barry Nakazono
Writing: David McKenzie
Game Design: Mike Alford, Robert Calvet, Clay Clement, Nadir Elfarra, Irene Kinzek, Phil Markgraf
68-page module.
August, 1987.

CONTENTS

KViSR Rocks! is the first (and so far, only) module for *Living Steel.* It provides a great deal more information about Vissers, the unfortunate people infected with a virus released by the Spectral invaders which renders them permanently sociopathic by genetically changing the structure of their brains. Vissers normally cannot exist in societal groups larger than the average street gang without self-destructing. Yet Vissertown, an entire town of 60,000 Vissers, has just been discovered. And something sinister is going on there—people are dying in Vissertown, and it may not be the natural fallout of victims of Vissers' violent natures. Included in the module are a mission briefing, and a complete description of Vissertown, including its people and places, and well-executed maps of important locales and Vissertown as a whole. Essays on Vissers, their behavior, and how to deal with them in game terms are given for the referee's use. More is revealed about the mysterious Spectrals, including a new type of Spectral, in a chapter on that topic. Finally, a section detailing the predicted course of the presented adventure in Vissertown is given along with options for divergences from the masterplot, and future uses of Vissertown in a campaign are suggested.

EVALUATION

Overall, this is a good sourcebook-type module. It is incredibly complete in its material on the locale of Vissertown. The Visser chapter does a lot to help a referee understand what Vissers are like psychologically so that they can be role-played with greater skill as non-player characters. The maps are excellent (although the center one of Vissertown as a whole is rather vaguely keyed and labeled). A look at what the monetary system on Rhand may have disintegrated into (barter and bullets being the mediums of exchange) is provided in a Goods and Costs table, which may inspire the referee with some insights on problems with trade and possible solutions to them. The only real wish one might have after reading the module is that more possible adventures which take advantage of this richly detailed setting might have been presented. The module could have been even more useful if more starting points/ideas for adventures were included.

—Julia Martin

Classifieds

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